

THE CHRONIC
DRUNKENNESS OFFENDER

CHAPTER XIII

AGES AND CAUSES OF DEATH
OF THE CHRONIC DRUNKENNESS OFFENDER POPULATION

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Project 52

Substudy 1 - 11 & 16 & 24 & T & Max - 71

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THE CHRONIC
DRUNKENNESS OFFENDER

CHAPTER XIII

AGES AND CAUSES OF DEATH
OF THE CHRONIC DRUNKENNESS OFFENDER POPULATION

AGES AND CAUSES OF DEATH
OF THE
CHRONIC DRUNKENNESS OFFENDER
POPULATION

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Substudy 1 - 11 & 16 & 24 & T & Max - 11

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OF THE CHRONIC DRUNKENNESS OFFENDER POPULATION

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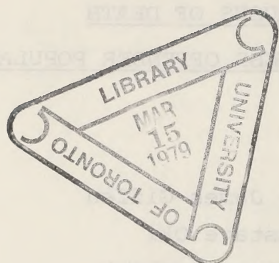
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CHAPTER XIII

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CHAPTER XIII

AGES AND CAUSES OF DEATH

OF THE CHRONIC DRUNKENNESS OFFENDER

POPULATION

The purpose of this chapter is to investigate the duration of life and the causes of death in a group of chronic drunkenness offenders.

The chronic drunkenness offender is not by definition an alcoholic; he is a person who has been repeatedly arrested and convicted for public intoxication. In actual fact, however, he is likely to be an alcoholic since an analysis of the drinking histories of our sample group of contemporary C.D.O.s indicates that over 90 per cent can be classified as alcohol addicts.¹

Chronic drunkenness offenders comprise a minority group among alcoholics - approximately 10 per cent of the estimated number of alcoholics in our society. We know little of the ultimate fate of this minority group within the larger alcoholic population. The literature discussed below and in later sections of this chapter, with one exception (Sundby), deals with the mortality of alcoholics in general rather than with specific socio-economic groups. It indicates that alcoholics die at a younger age than the general population and with the causes of death differently distributed. We will compare our sample of C.D.O. alcoholics with other alcoholics and with a normal population, with the expectation that our sample will differ from both.

¹ Chapter XI, Drinking History, Chronic Drunkenness Offender Study.

Most chronic offenders are part of the homeless, unattached population of Skid Row and as such would appear to be subject to a double hazard. That is, they not only have increased risk of death due to their heavy drinking or alcoholism, but also the additional risks that go with conditions of Skid Row living. Bogue (13) has summarized these in his study of Chicago's Skid Row. Comparisons with his study will also enable us to determine whether the C.D.O. differs from the rest of the Skid Row population in mortality and morbidity patterns. We would expect the rates and causes of death among chronic drunkenness offenders to differ from other alcoholics because of the additional factors of Skid Row living. At the same time we could expect them to differ from the rest of the Skid Row population because the C.D.O.s have a unique way of life within that population. The frequent stays in jail which are part of the revolving door pattern reduce the exposure to the physical damage that appears to result from life on Skid Row and also cut down on the length and number of their drinking sprees. The enforced period of recuperation with a balanced diet, regular meals and sleeping hours, and abstention from alcohol might to some extent offset the effects of deficient diet and irregular hours outside of jail. (Of a sample of 85, 88 per cent gained weight during their incarceration - Chapter XII, p. 42.) During the course of our study of contemporary chronic drunkenness offenders, the examining physician derived the impression that on the whole the men were in much better health than would be expected in view of their age and way of life: almost two-thirds were judged by him to be capable of heavy physical labour. (See Chapter XII - Physical Health.)

If it is the revolving door which has this beneficial effect, then the extent of the benefit may be expected to vary with the zeal with which the local police arrest drunks and bring them to trial.

The Toronto police are noted for their zeal in this direction.² A majority of chronic offenders who were interviewed stated that the probability of being arrested and jailed for drunkenness was much higher in Toronto than in other communities of their experience. This situation had prevailed for as long as they could remember.

If this impression is correct, the ages and causes of death in a sample of Toronto chronic offenders should reflect the beneficial effects on health of frequent stays in jail when compared to other Skid Row populations and also perhaps to higher status alcoholic populations not vulnerable to frequent arrest. The expected effects would be in the direction of lengthening life and diminishing the proportion of deaths from causes closely related to alcoholism and malnutrition, such as liver cirrhosis. The possibility of arriving at definite conclusions depends in part on the availability of comparable data on other populations. Comparisons between the chronic drunkenness offender sample and the general male population can be made with some assurance. Unfortunately the comparative data on other alcoholic and Skid Row groups are not sufficient to be definitive. However, we will use four studies, described below, for comparison purposes. Two are studies of alcoholic populations and one is a study of Skid Row. The sample of men in the fourth study, the Norwegian "Vagrant" group, described by Per Sundby (122), are probably closest, both in their way of life and in their drinking habits, to our sample.

² One reason for this is probably that Toronto's Skid Row is not as clearly demarcated as the Skid Rows of such cities as New York and Chicago. In those cities it is possible for the police to follow a containment policy in handling Skid Row drunks: as long as they stay within the area without creating undue disturbance few are arrested.

THE COMPARISON STUDIES

The Alcoholic Groups

Addiction Research Foundation Clinic.- The Schmidt and de Lint (111, 112, 113) study population consisted of 5,395 alcoholic men³ admitted to the Toronto Clinic of the A.R.F. between 1951 and 1963. Two social classes were distinguished using educational achievement, occupation, and residential characteristics as the criteria of selection. One, the "working class," had public school education only, were semi-skilled or unskilled, and lived in low rental areas. The "middle class," comprised mainly white collar workers, salesmen, small proprietors, with high school or technical school training, and 12 per cent were college graduates who were professionals or had managerial positions. They tended to live in lower to medium price range housing in suburban developments.

Although admission to the Clinic is free, the number of chronic drunkenness offenders who find their way to it is such a small percentage of the total as to have little effect on the figures. The authors say: "This group did not include so-called Chronic Drunkenness Offenders, who are rarely seen at the Foundation's Clinic." (112, p.3). Actually, we found that 13.5 per cent (that is, 31 men) of our 1960 sample of C.D.O.s had had some form of contact during their lives with the A.R.F. Clinic, (Chapter XVI, History of Treatment). However, we can agree with the authors that the population of their study consisted essentially of non-Skid Row alcoholics.

³ Their study also included 1,119 women. We will use the statistics on the male patients only, since this sample of chronic drunkenness offenders is entirely male.

Lipscomb's Sample.- This sample of 1,431 alcoholic men was drawn during two periods - 1954 and 1956-7 - from four alcoholism treatment centres: the Santa Rita Rehabilitation Center, which is a prison farm with an alcoholic treatment facility; Mendocino and Napa State Hospitals, mental hygiene hospitals to which alcoholics may be committed for treatment; and the San Francisco Adult Guidance Center, a voluntary outpatient clinic for alcoholism treatment (69).

This alcoholic sample may well include a certain number of chronic drunkenness offenders, although we can only conjecture from the data. Lipscomb says, "This study, like most others in the field, concentrates on "Skid Row" alcoholics, on those who have been arrested or committed, and on those who have been treated in the relatively recent voluntary outpatient clinics." (p.52).

We would expect that any C.D.O.s in the sample would be found mainly in the Santa Rita Rehabilitation Center group. From our own experience and observations few chronic drunkenness offenders find their way to mental hospitals or to voluntary outpatient clinics. Mental hospitals require commitment, either by relatives or friends, or one's self. Since the C.D.O. is usually disaffiliated from family and friends, and does not consider himself mentally ill, he is not likely to be committed to a mental hospital. We have also found that the C.D.O. is unlikely to have the motivation to seek voluntary treatment.

Thus, although Lipscomb's is not as "pure" an alcoholic sample as the A.R.F. Clinic in that it undoubtedly contains both Skid Row persons and C.D.O.s., the chances are that the proportion of C.D.O.s is not very great.

A Drunkenness Offender Group

Sundby's Sample.— The 1,722 male patients who were discharged in the years 1925-39 from the Psychiatric Department of Ullevål Hospital in Oslo with a diagnosis of alcoholism comprised the case material for the Sundby (122) mortality study. These he divided according to social characteristics into two groups, which he called 'non-vagrants' and 'vagrants'. The non-vagrants had maintained "a fairly normal social adaptation in spite of alcoholism." The vagrants were the public-offender alcoholics who had at least three penal convictions. It is not certain from the text whether the convictions were for public drunkenness or other offences. Sundby explains the selection in this way:

All patients were checked with the National Penal Register of Norway, and a group of 408 patients with three or more penal sentences were considered to make a special group of vagrant alcoholics. As such alcoholics in Norway are often convicted under a special vagrancy law, an often convicted group of alcoholics may be considered to consist mainly of Skid Row and other alcoholics leading an irregular life and of particularly low social status. (p.169)

Sundby feels there are many variables, both environmental and hereditary, related to the observed higher mortality of this group, other than the effects of excessive alcoholic intake. For example, unmarried, divorced, and widowed men tend to have higher death rates than married men and since many alcoholics also tend to be unmarried, separated, or divorced, he suggests that marital status will account for some of the excess mortality.

He also mentions the relationship between smoking and alcoholism. Heavy drinkers tend to be heavy smokers. The excess mortality associated with alcoholism may be partially due to smoking and other poor health habits, or the latter may potentiate the effects of the former to produce excessive mortality rates.

Sundby is stressing the point that the high mortality rate may be due not only to alcoholism itself but to alcohol-related factors.

The mortality ratio differs very little between the vagrant and non-vagrant groups, although the vagrants seemed to have experienced higher mortality earlier in life, while the mortality of the non-vagrants becomes higher from the age of 40 on. This was an unexpected finding, since Sundby's information indicated that those men in the vagrant group suffered from more severe and long-lasting types of alcoholism than the others. He offers the explanation that the vagrants are protected somewhat from the effects of severe alcoholism through their frequent periods of incarceration. This is similar to our own impression that the revolving door plays a role in protecting the health of the chronic drunkenness offenders. (See Chapter XII, Physical Health, p.62.) Sundby also suggests that their way of life may protect them from vascular disease in middle and old age in comparison with non-vagrants.

The Skid Row Group

Bogue's Sample.-- The Bogue (13) sample of 613 men was drawn from Chicago's Skid Row during December 1957 to April 1958. He found at least 6 different types of men living on Skid Row: the elderly and physically disabled, resident workmen, migratory workers, bums, criminals, and chronic alcoholics. They lived there because living is cheap, there are congenial drinking places and companions, it is comparatively anonymous and tolerant and therefore a suitable place for deviates and those who want to or have been forced to escape from society and its responsibilities. Alcoholism is not nearly as large a factor in the discussion of Skid Row man as it is in the discussion of the chronic drunkenness offender.

Bogue classified 32.5 per cent of the Skid Row population as alcoholics, consisting of "heavy" and "derelict" drinkers (p.95). These would be similar to the 95 per cent of Toronto C.D.O.s who live on Skid Row.

The social characteristics of the Skid Row men have many similarities to our group of C.D.O.s. Only 10 per cent are under 35 years of age; a large proportion (64%) have never been married; and many are unemployed or have only occasional work. Twenty-two per cent had steady work at the time of the study, which is considerably higher than that of our 1960 sample (2%).

Bogue found that the death rate on Chicago's Skid Row was much higher than in the general population. In fact he stated that Skid Row inhabitants can expect to live less than one-half the number of years remaining to men of the same age in the general population. He suggests the following reasons for this:

- (a) There probably is a selective process, whereby men without families whose health is failing and who have no money or persons to care for them move here to die.
- (b) Men who have lived in poverty and without medical care for many years would be expected to have high mortality rates.
- (c) Prolonged heavy drinking undoubtedly causes the life span to be drastically reduced - many men on Skid Row literally drink themselves to death.
- (d) Life in the cubicle-type hotels may be conducive to the spread of infectious diseases, and especially to pulmonary disorders.
- (e) Medical help is unavailable to many of the homeless men when severe illness strikes.
- (f) Homeless men may be far more negligent in caring for their health than most other men; they may eat poorer food, get less rest, work when ill, etc.

Bogue's finding that only a third of the men on Skid Row are "heavy drinkers" or "alcoholic derelicts" lends credence to the argument that the high death rate on Skid Row is not solely due to the prevalence of alcoholism; other hazards of the types he suggests are probably involved.

Bogue found that the heavy drinkers and alcoholic derelicts (roughly comparable to our chronic drunkenness offenders) were younger, on the average, likely to have had more education and to have achieved a higher socio-economic status than the other two Skid Row groups, the "light drinkers" and the "teetotalers." In other words, they tended to be closer to the population average in social characteristics than the temperate or abstaining men on Skid Row.

METHOD

Selection of Sample

The original sample of chronic drunkenness offenders was drawn from the list of men who had served at least one sentence in the Toronto Jail in 1940 for public intoxication and who had been convicted at least 3 times for this offence within the 12 months preceding his incarceration. Every fifth case in this category was selected from the names of those admitted during the first week of every month and the process was continued for the second, third and fourth weeks of each month until a total of 400 different names had been drawn. If the fifth individual proved to be someone who had already been selected, the sixth name was taken, and so on. The decision to have each month represented but each week only if necessary to get 400 different names, was based on the observation that arrest patterns varied considerably from season to season but little from week to week.

The original number of 400 was eventually reduced to 343 (85.8%) offenders as duplication came to light during the course of the study. Some persons had been included in the sample more than once because of occasional differences in the spelling of names in the jail register, and some because they had used aliases.

The year 1940 was chosen as the sampling year to allow at least two decades of risk. Since this was a year Canada was at war, some younger and presumably healthier C.D.O.s might have left this population by volunteering for military service, thus biasing the ages and causes of death as compared to a peacetime population. However, all available studies of the age distribution of chronic offenders, including our own,⁴ indicate that only a small minority are young enough to be eligible for military service.

⁴ That is, of our 1960-61 sample.

It is also likely that in the early stages of World War II, when admission standards were fairly high, of those chronic drunkenness offenders who were young enough to volunteer and who were motivated to do so, quite a number would have been rejected on the grounds of their conviction record or their alcoholism.

Information from the Department of Veterans Affairs indicates that the sample was not significantly affected by war service after 1940. Only two of the men were recorded as serving in the Canadian Forces during World War II and both of them were discharged within a year as "physically unfit."

As we shall see when we examine the social characteristics of the mortality group, they do not differ greatly from present-day chronic drunks.

It should also be mentioned here that the milieu in which they lived did not change radically over the 22 years encompassed by this study. While the war and period of reconstruction resulted in considerable change in the country as a whole, this change was not greatly felt on Skid Row. There were no amendments to the Liquor Control Act of Ontario that had any effect on the C.D.O. There was no significant change in the policy of the Toronto Police regarding 'keeping the streets clean' of public misdemeanants. There was no substantial redefinition or change in the Skid Row environment (89).

Source of Data

Information on the fate of the chronic drunkenness offenders after 1940 was derived almost entirely from the records of the Registrar General of Ontario and from various public and private agencies dealing with homeless men or alcoholics. Tracing the men through these records was often a problem since the information originally available in the jail register was sufficiently scanty or even inaccurate to make it difficult to identify them. Such

information concerned name, address, occupation, age, height, hair and eye colour, religion, marital status, education, country of birth, and number of previous offences. This was mostly provided by the person himself to the jail staff who had no means of checking all the facts for accuracy. Current studies of chronic offenders in Toronto as well as the follow-up information on some of the 1940 sample, show that much of these data is misleading. For example, the occupation given is frequently one that the man had not pursued for many years; the address is likely to change so often that it is useless for identification; many of the men who listed themselves as 'single' were in fact legally married, although they had not lived with their wives for many years.

Convincing evidence of the unreliability of these records is that many of the "facts" about the same individual differ in the record of subsequent admissions to jail and in the records of the various agencies.

Despite these shortcomings of the original data, a careful cross-checking of data from many sources made it possible to find some trace of all but 27 (7.9%) of the 343 men between 1940 and 1961 and to be reasonably certain of correct identification.

The primary source of the information used in the analysis was the office of the Registrar General, where the annual registers of deaths in the province of Ontario from 1940 to 1961 were searched for the names of the men in the sample. A death certificate for any individual provided information on his age at the time of death, the imputed cause of death, place where death occurred, and the relationship to the subject of the person reporting it. Verifying the death certificate was often difficult since several men of about the same age and of the same name were found to have died in the same period. The original death certificates were copied in each case and compared with additional information from informants and institutional records to match the individual with the certificate. In the case of extreme doubt, three raters examined the evidence and the certificate was used only when they agreed unanimously on the identity.

The absence of a death certificate was not in itself proof that a member of the sample was still alive in 1960-61. He might have died in another province, or been using another name at the time of his death - or his body may have remained unidentified. If he had left the city and was still alive, he would have been traced to 1961 only if he were in an Ontario mental hospital or a reformatory or in a Federal penitentiary about that time.

The person for whom no death certificate was found was presumed to be alive only until the last date to which he could be traced through records or the memories of officials or fellow chronic drunkenness offenders. He was used in the calculations as surviving through each age category until he could no longer be traced; at which point he was dropped from the population at risk.

In the final analysis death certificates were found for 191 (55.1%) of the 343 men. Twenty-seven men (7.9%) could not be traced beyond the 1940 jail term that had qualified them for the sample. Fifty-nine (17.2%) were traced to some time in the intervening period between 1940 and 1961 and then lost (Table XIII-1), and 66 (19.2%) were known to be still alive in 1961.

TABLE XIII-1

CHRONIC DRUNKENNESS OFFENDERS TRACED FROM 1940 to 1961

Year	Number of Withdrawals from trace		Number of Deaths	
	N	%	N	%
1940	31	9.0	8	2.3
1941	2	.6	10	2.9
1942	3	.9	4	1.2
1943	1	.3	11	3.2
1944	1	.3	4	1.2
1945	-	-	13	3.2
1946	1	.3	6	1.8
1947	5	1.5	11	3.2
1948	4	1.2	10	2.9
1949	2	.6	11	3.2
1950	4	1.2	12	3.5
1951	3	.9	9	2.6
1952	6	1.8	9	2.6
1953	2	.6	5	1.5
1954	2	.6	8	2.3
1955	-	-	8	2.3
1956	-	-	9	2.6
1957	3	.9	6	1.8
1958	4	1.2	8	2.3
1959	6	1.8	6	1.8
1960	6	1.8	14	4.1
1961	66	19.2	9	2.6
Total	152	44.7	191	55.1

Supplementary information used in identification and tracing of the mens' careers after 1940 was secured from the records of a variety of agencies and institutions: hostels and missions for homeless men in Toronto, homes for the aged, a veterans' hospital in Toronto, Ontario mental hospitals, the Ontario Department of Reform Institutions, and the Penitentiary Branch of the Department of Justice (Canada).

Employees of the Don Jail and a few of the older C.D.O.s proved to be a further valuable source of information.

SOCIAL CHARACTERISTICS OF THE CHRONIC DRUNKENNESS OFFENDER MORTALITY SAMPLE

Our own and other studies (31, 101) of the chronic drunkenness offender indicate that C.D.O.s are likely to be middle-aged and older; to be native-born; to be isolated from the usual kinship attachments and formal organizations; to live in the hostels, flophouses, and cheap rooms of the Skid Row area when they are out of jail; to be rarely employed and then at casual labour; to drink the cheapest forms of beverage alcohol or, not infrequently, non-beverage alcohol when nothing else is available.

The data gathered on the 1940 mortality sample were not always of a type to establish conclusively the frequency or even the existence of these characteristics. Nevertheless, the offenders in this sample do appear to conform in regard to all the items on which evidence is available.

An examination of these characteristics will bear this out.

Age.-- In Table XIII-2, the ages of the mortality sample are shown. They are compared with a random sample of all men convicted for a third or subsequent drunkenness offence within 12 months in Toronto, 1961, and with the general Ontario male population in 1940.

TABLE XIII-2
AGES OF TORONTO MORTALITY SAMPLE AND TORONTO DRUNK
COURT MULTIPLE OFFENDERS AND ONTARIO MALES
(Percentages)

Age	Mortality Sample	Drunk Court ^a	Ontario Males ^b
21 - 25	1.5	2.1	12.7
26 - 30	3.8	6.0	12.5
31 - 35	3.8	8.1	11.4
36 - 40	12.5	18.7	10.9
41 - 45	12.8	16.1	10.0
46 - 50	18.4	15.2	9.3
51 - 55	17.2	15.6	8.6
56 - 60	14.3	10.5	7.3
61 - 65	7.9	5.1	5.9
66 - 70	4.6	1.7	4.5
71 and over	3.2	.9	6.8
Total	100.0	100.0	99.9
N	(343)	(1,176)	(1,280,057)

^a One in five random sample of 3+ offenders from "G" Court, Toronto, 1961.

^b Dominion Bureau of Statistics, 1941. Age intervals for these data are 20-24 etc.

Approximately 90 per cent of the men in the mortality sample are 36 years of age or over, with a mean age of 48.9 years.

This group has a somewhat smaller proportion (9.1%) of men under 36 years than the 1961 Court sample. This is the age group in which recruits to the Armed Services would have been mainly concentrated, so that the War may explain the difference. However, it could hardly account for the considerably higher proportion of the 1940 sample being over 50 years of age.

Both samples vary a great deal from the general population of Ontario which shows a fairly even distribution in all three larger age categories with the greatest number, however, under 36 (37.8%).

Country of Birth.— The majority are native-born Canadians and most of those who are not have come from the British Isles.

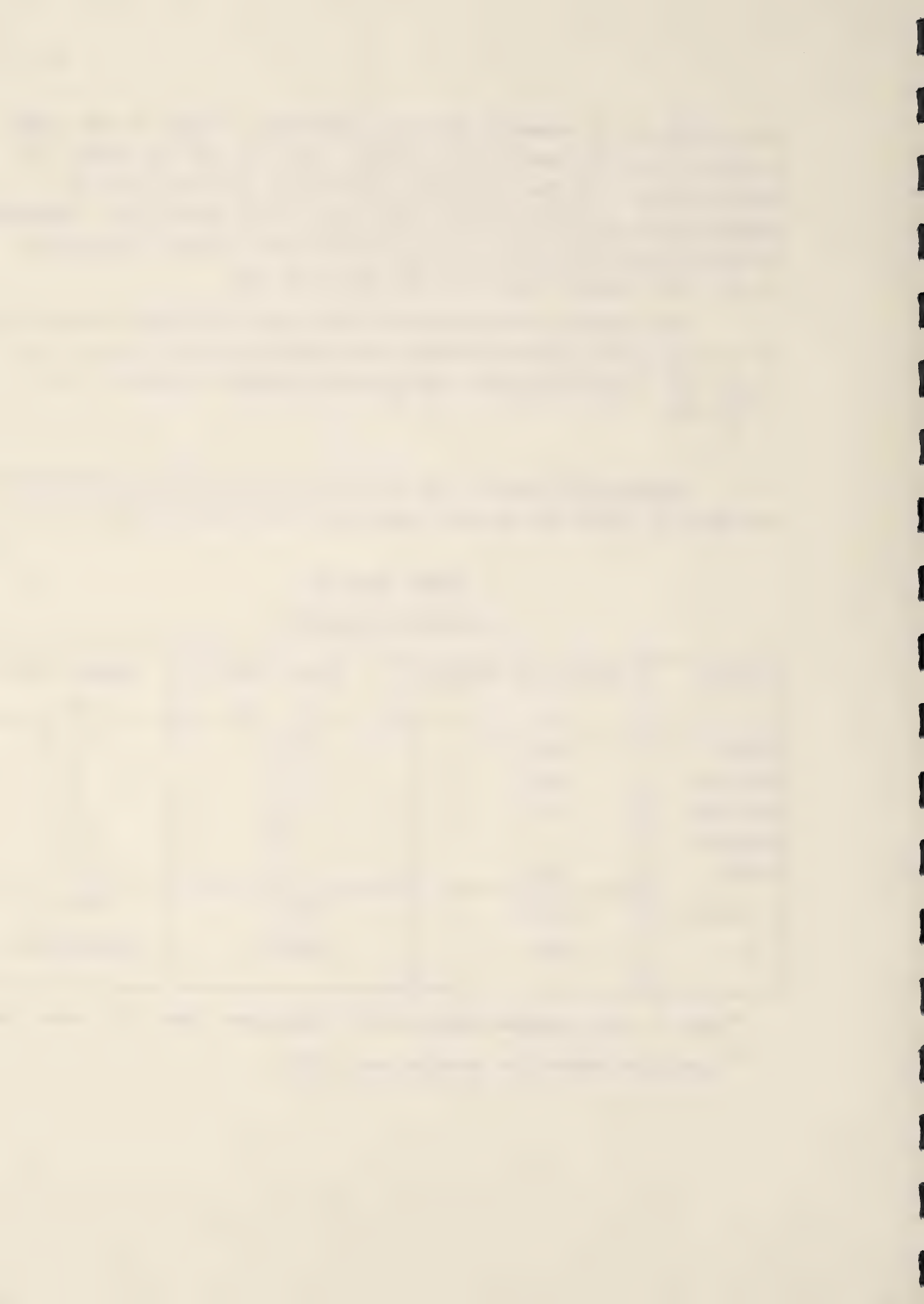
TABLE XIII-3

COUNTRY OF BIRTH

Country	Mortality Sample	Drunk Court ^a	Ontario Males ^b
	%	%	%
Canada	68.8	85.3	71.3
Ireland	11.1	5.1	1.7
Scotland	7.9	3.0	3.7
England	7.3	2.0	11.3
Others	4.9	4.6	12.0
Total	100.0	100.0	100.0
N	(343)	(1187)	(1,280,057)

^a One in five random sample of 3+ offenders from "G" Court, Toronto

^b Dominion Bureau of Statistics, 1941.



There is a very close correspondence to the general population at that time. On the other hand, they varied from the Court sample of C.D.O.s in the proportion of native-born men: 69 per cent of the men in the 1940 sample were born in Canada as compared to 85 per cent of the 1960 group. Twenty-six per cent of the former were born in the British Isles and only 10 per cent of the latter group. The difference may be related to a drying-up of the flow of immigration from the British Isles during the 1930s and the early 1940s. (See Chapter IV, Statistical Profile.) In both samples, whether native-born or not the men were predominantly of British ethnic origin. Furthermore, less than 4 per cent of both samples were non-Caucasian, most of this small number being North American Indian.

Marital status.— The marital statuses of the offender samples described in Table XIII-4 are undoubtedly misleading if not incorrect, for reasons mentioned above (p.12). However, the great majority declared themselves to be currently unmarried, which in itself is seen to be a state of affairs unusual for men of this age.

TABLE XIII-4
MARITAL STATUS

Status	Mortality Sample %	Drunk Court ^a %	Ontario Males ^b %
Single	54.5	63.3	27.6
Married	25.4	35.2	66.4
Separated	7.3	.3	1.1
Divorced	1.7	.3	.2
Widowed	11.1	.9	4.7
Total	100.0	100.0	100.0
N	(343)	(1,184)	(1,280,057)

^a One in five sample of 3+ offenders from "G" Court, Toronto.

^b Dominion Bureau of Statistics, 1941.

Occupation.-- The description of occupation is also very misleading as the men are likely to list as their occupation what they formerly did or what they would be doing if they were still employed, rather than what in fact they do between jail sentences. Also, there is no category for casual labour (Table XIII-5). Since all the men are in prison at least on their third conviction for public drunkenness within 12 months, the occupations listed are likely to be those of an earlier period in their lives, if not entirely fictional.

It is difficult to conjecture the reasons for the considerable discrepancy between the two offender groups in the matter of occupational status. (In both cases, the material was obtained from police records.) It would seem that at least in this area the 1940 group is rather different from the contemporary chronic drunkenness offenders.

TABLE XIII-5
OCCUPATIONAL STATUS

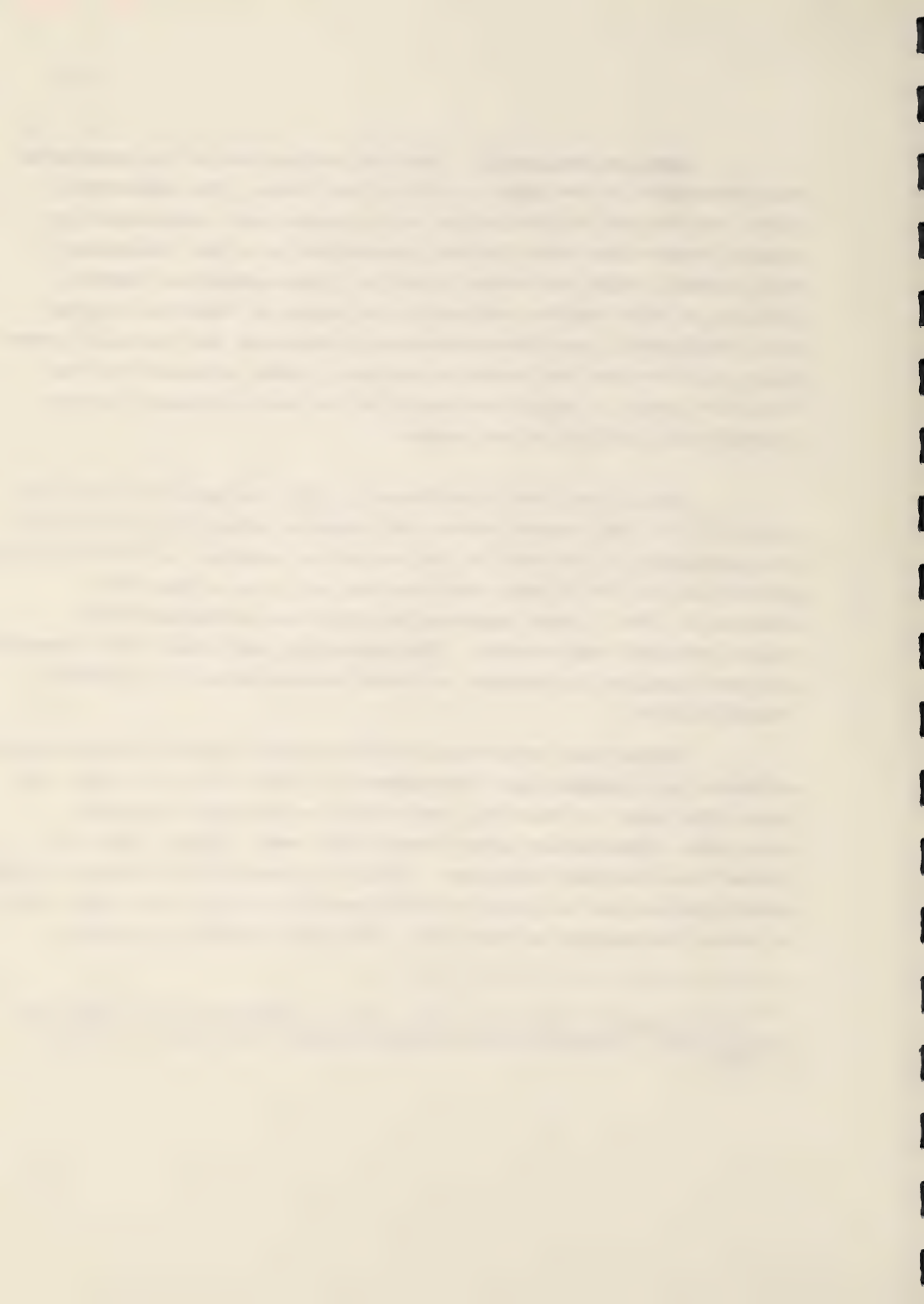
Occupation	Mortality Sample %	Drunk Court %
Professional and semi-professional	5.6	1.3
Skilled and semi-skilled	33.3	22.6
Unskilled	57.0	72.6
Pensioners and retired	4.1	3.5
Total	100.0	100.0
N	(343)	(1,027)

Area of Residence.-- Another indication of the status of the offenders is the area in which they live. The addresses given by the men to the police were located and classified by census tracts and then further classified into the following main areas: Skid Row areas (that is, those areas of Toronto defined as Skid Row by virtue of the types of housing, stores and restaurants, and the existence of missions and hostels⁵ where many Skid Row men are known to reside); areas adjacent to the Skid Row areas in which residents of low socio-economic status predominate; and all other areas.

Areas that are significantly Skid Row make up less than one-tenth of the census tracts yet contain almost 75 per cent of the addresses of the men in the mortality sample. A considerable proportion of the 26 per cent who did not give a Skid Row address in 1940, later appeared at Skid Row addresses when traced through the records. The mortality and drunk court samples are very similar in respect to their stated area of residence (Table XIII-6).

During our investigation of the 1961 chronic drunkenness offender jail sample used throughout the rest of this study, we found that many of them for one reason or another had given inaccurate information about where they were living and had listed non-Skid Row addresses. This was corrected through further investigation and we found that 90 per cent of the men were living in areas designated as Skid Row. We might suspect a similar

⁵ See Chapter VII, this study, for a description of Skid Row. The physical boundaries were approximately the same in 1940 as in 1960.



revision for the two samples described in Table XIII-6. However, even if the information is correct, approximately four-fifths of the mortality group are also a Skid Row sample.

TABLE XIII-6
AREA OF RESIDENCE

Area	Mortality Group %	Drunk Court Group %
Skid Row	74.1	71.2
Marginal Skid Row	4.9	6.9
Non-Skid Row	18.7	17.9
Out-of-town	2.3	3.9
Total	100.0	99.9
N	(343)	(1,180)

We can conclude then that the 1940 sample of chronic drunkenness offenders is, like the contemporary offenders, made up primarily of homeless Skid Row alcoholics.

AGE OF DEATH AND DEATH RATES

We are interested in this section in determining the degree to which the mortality characteristics of the chronic drunkenness offender sample differ from other populations. We expect that the sample of C.D.O.s will have a higher death rate and a lower age of death than the normal population. Moreover, because the revolving door process appears to mitigate many of the damaging effects of the Skid Row environment, we would expect the C.D.O.s not only to differ from Bogue's sample of Skid Row inhabitants but to differ from Bogue's sample more than from alcoholic populations in respect to rates and age of death. In other words we suggest that the debilitating effects of a Skid Row existence are less severe and/or more reversible than the effects of alcohol and that alcoholism is the primary determinant of mortality among the chronic drunkenness offenders.

Review of the Literature

The literature on the mortality of alcoholics points to the conclusion that heavy alcohol consumption is related to high rates of mortality.

Studies of deaths from "alcoholism" are usually based on vital statistics records in which alcoholism is listed as the primary cause of death only when acute alcohol poisoning and alcoholic diseases are reported. Jellinek (53) and others have pointed out that physicians are apparently reluctant to certify death from alcoholism, partly out of consideration for the deceased's family and also, as Carson (18) points out, the significance of alcohol may be overlooked in many accidents and deaths. Hence, deaths from this cause are considerably underestimated in statistics compiled from death certificates. However,

Tuyns (126) in his 1957 study of mortality from alcoholism in Belgium found that physicians were much freer in specifying alcoholism as the true cause of death than earlier in the century.

In any event, deaths attributed to alcoholism are only a portion of the deaths of alcoholics. They do not furnish the means of estimating the general mortality rates of alcoholics nor of assessing the contribution of alcoholism to an increased or diminished risk of death from other causes.

In studying deaths from alcoholism as a primary cause in the United States in 1940, Jellinek found that the majority of deaths occurred between 35 and 59 years of age, with 45-49 years the highest single age class (53). When converted to death rates per 100,000 population, the highest rate of deaths from alcoholism for white males is found in the age class 55-60 years.

In an earlier study of deaths from alcoholism in the United States from 1934 to 1938, (Schmid (110) had found the highest rate in the age class 50-54 years (11.9 per 100,000), although the rates varied over a range of only 2.4 points in the age classes between 40 and 70 years.

A number of studies comparing mortality among abstainers and non-abstainers have been based on statistics of deaths of policyholders of life insurance companies. In a summary of studies published between 1910 and 1929, using American, Canadian, and British life insurance statistics, Hunter (48) concluded that abstainers are, on the whole, longer-lived than non-abstainers; that moderate users who drink only occasionally and in small amounts are as long-lived as total abstainers; that less moderate users who drink the equivalent of a glass of whiskey a day have

a higher than average mortality, partly because some of them go on, in the years following the insurance examination, to exceed this amount of drinking; and finally, that those who occasionally get intoxicated or go on sprees are "distinctly shorter-lived than the average." In a more recent study (1953) based on statistics from 10 insurance companies in the United States and Great Britain, Arnould (5) concluded that even moderate drinkers have, on the average, a shorter life span. Both Menge (79) and Davies (26) found excessive mortality for all classes of drinkers - social drinkers as well as spree drinkers and "steady free users." Moreover, both these authors found that reducing excessive drinking through treatment or otherwise, has little effect on the mortality rates which remain higher than the "never-dranks".

Life insurance policyholders are probably drawn from a different socio-economic level than most chronic drunkenness offenders since they are required to pay regular premiums. They are also a selected group in terms of health, since a medical examination is usually required which would result in the rejection of some applicants in poor health. The sample of Baltimore working-class people in Raymond Pearl's 1926 study (99), drawn from the records of a city health department, a hospital dispensary, and juvenile court records, may more closely approximate the socio-economic level of chronic drunkenness offenders. Pearl found that the mortality among heavy drinkers was considerably higher than among moderate drinkers and abstainers, but he also found that moderate or occasional drinkers had a lower mortality than abstainers. Unfortunately, an examination of his methods casts some doubts on the reliability of his findings. He used individuals in his sample as sources of information on all the members of their families, including grandparents, extending in time from 1830 to 1920; the reliability of hearsay information on the drinking habits of individuals long dead is open to question. Critics have also questioned the representativeness of a sample drawn from the sources Pearl used.

Gillis (37), in 1969, found the overall mortality rate, matched for age and sex, four times that of the general population. He also noted a lower rate where there was post treatment involvement for alcoholism, whereas Menge (79) found that the higher rates of all excessive drinker categories continues to be higher even after excessive drinking ceased, and Davis, too, (26) found no differences in the mortality rates of alcoholics who had treatment and those who did not have it.

Sundby (122), Gillis (37) and Kuller (61) all note that excess mortality due to alcoholism is highest in the youngest age groups: Gillis, who compared a group of treated alcoholics with the general population, mentions 12.5 times the general rate in the 21-25 age group, and Kuller 8 times in the 20-39 age group. However, as Sundby points out, "a small rise in mortality ratios in age groups with high mortality rates may have a much greater effect upon total mortality than a pronounced rise of the ratio in age groups with low mortality rates." (122, p.48).

Because the presence of addiction to alcohol cannot be consistently determined from vital statistics or life insurance records, studies of the mortality rates of alcoholics are rare. Such studies require the time-consuming follow-up for a period of years or to the point of death of individuals identified as alcoholics through their presence in treatment facilities or in court records for repeated convictions for drinking offences.

Lanterburg (63) reports one study of this type using the resident and discharged population of the Zurich institution for alcoholics during the period 1935-44 and comparing the mortality and age of death with the general adult population of Zurich. The death rate for the male adult population is 59 per 1000, whereas the rate of the male patients is 93 per 1000; while among the general male population of Zurich the highest frequency of death occurs in the age class 65-69 years, followed by 70-74 years, the highest frequency among the alcoholics occurs in the age-class 64-64 years, followed by 55-59 years. In the

general male population 53.8 per cent of the deaths occur between the ages of 40 and 69 years, 34.1 per cent above this age, while the comparable figures for the male alcoholics are 76.4 per cent and 17.6 per cent.

Lipscomb (123) found that the average annual death rate of his sample of treated alcoholics in California (described above) was nearly two and one-half times the rate for the California white male population (123, p.206). The age-adjusted 5-year survival rate was 91.4 per cent of normal (123, p.204).

Sundby (122, p.48) found that the mortality among his group of 1,722 alcoholic patients was 113 per cent higher than the expectation of deaths among the Norwegian male population. In Sweden, however, Dahlgren (24) investigated some 10,000 cases to come before two Temperance Boards between 1939 and 1947. These included persons who were "warned, superintended or treated in an institution" (p.298). There were 564 deaths recorded during this period. In contrast to Sundby's data Dahlgren found very little difference in the ratios between the mortality of the alcoholics and the expected mortality of the Swedish male population.

With the exception of Dahlgren the literature indicates that researchers have found alcoholism and high mortality rates go hand-in-hand. Alcoholics die at a younger age than either abstainers or members of the general population. Some authors suggest that even moderate drinkers and those who give up excessive drinking or who undergo treatment for alcoholism have excessive mortality rates.

In discussing mortality caused by alcoholism in Australia, Derrick (28) associates mortality from certain causes such as cirrhosis, cardiomyopathy, and malnutrition, with chronic alcoholism, while mortality from accidents of various kinds he associates with acute alcoholism or intoxication.

Sundby makes a similar distinction of causes but on a different basis. He suggests that alcohol has both physiological and behavioural effects on the human organism which are reflected in mortality rates. The physiological effects are seen in the higher death rates by cancer, cardiovascular and respiratory diseases, the behavioural effects in the suicide and accident rates.

Placing suicide among behavioural effects of alcoholism is certainly debatable. However, it seems reasonable to distinguish between mortality that is the result of long years of heavy drinking and addiction, and mortality that is partly caused by an excess intake of alcohol over a short period. Heavy drinking and alcoholism appear to cause irreversible physiological damage. This might account for the findings that alcoholics who undergo treatment and subsequently abstain from drinking still have excessive, though reduced, mortality rates, for the treatment would not reverse physiological damage but it should have an immediate preventive effect on 'behavioural' deaths.

AGE OF DEATH OF CHRONIC DRUNKENNESS OFFENDERS

The proportions of the known dead in the chronic drunkenness offender sample who died in each age class are compared with proportions of Ontario male deaths at the same ages in Table XIII-7 and Figure 1. Since the first death in the sample occurred at age 37, the population of Ontario male deaths starting with the age class 35-39 years has been used for comparison. Ontario life tables for the year 1951 are used throughout because it is the middle year in the 1940-61 period during which the sample was exposed to risk. In any event, Ontario mortality figures have varied little over this period.

TABLE XIII-7
COMPARISON OF AGE OF DEATH OF CHRONIC DRUNKENNESS OFFENDERS AND
ONTARIO MALES

Age of Death	C.D.O. Mortality Sample		Ontario Males ^a
	N	%	%
35-39	3	1.6	1.9
40-44	7	3.7	2.9
45-49	6	3.1	4.4
50-54	18	9.4	6.4
55-59	38	19.9	8.5
60-64	41	21.5	11.9
65-69	32	16.7	14.1
70-74	22	11.5	14.8
75-79	17	8.9	14.5
80-84	6	3.1	11.0
85 and over	1	0.5	9.7
Total	191	100.0	100.0

^a Ontario Adult Males, 1951. Dominion Bureau of Statistics.

The comparison reveals that the highest proportion of the deaths of the chronic drunkenness offenders occurred in the age-class 60-64 years, followed by 55-59 years. Among the Ontario male population the highest proportion of deaths took place between ages 70-74 years inclusive, a decade later than the maximum for the inebriates and the next highest proportion in the age-class 75-79 years.

In the Addiction Research Foundation sample of alcoholic male patients, the 55-59 age-class held the highest proportion of deaths (19.7%) followed by the 45-49 year group (15.9%), (112, p.114). The highest proportion (18.4%) in Bogue's Skid Row sample (13, p.225, Table 8-1) occurred between the ages of 50 and 54, 10 years earlier than our mortality sample, and was followed by 55-59 years (14.0%).

The average age of death for the deceased chronic offenders is 62.6 years and approximately 62.6 years for Bogue's Skid Row sample, compared to 68.3 years for Ontario male deaths at 35 years and older. Approximately 76 per cent of the deaths of chronic offenders had taken place by age 70, as against 50 per cent of the Ontario male deaths at 35 years and older.

However, this simple comparison of frequencies does not take into account differences between the chronic drunkenness offender sample and the Ontario male population in the proportions exposed to risk at various ages. Since the age distributions are not similar, a comparison of actual and expected deaths by age classes gives a more accurate picture of the differences between the chronic drunkenness offenders and the general population.

Actual and Expected Deaths

In Table XIII-8 the actual deaths in the C.D.O. mortality sample by age classes are compared with the deaths that would be expected if the inebriates' death rates were the same as those of the Ontario male population of the same ages, and the ratios for the same age groups are shown for the A.R.F. male alcoholics.

The number exposed to risk (Ex) is determined through the continuous tracing of each subject, starting with his age as given in 1940, and counting him as an individual exposed to risk at each successive age, until the age at which he dies or disappears from the records. For example, if a chronic offender became 50 years of age in the early part of 1940 and died or disappeared in the latter part of 1945, he would be included in the aggregate numbers exposed to risk at ages 50, 51, 52, 53, 54, and 55. Previous to, or beyond these ages, he would not be included in the calculations. The expected deaths in the sample by 5-year age classes (d_x^1) are the product of the number exposed to risk and the probability of dying of the Ontario male population of the same ages (qx). To facilitate comparison, the ratio of actual to expected deaths is also shown.

Actual deaths exceed expected deaths in all age-classes from 35 years to 84 years. The discrepancy expressed as a ratio is largest between 35 and 44 years of age, after which it falls and then rises to another but lower peak between 55 and 59 years. The picture is similar for the A.R.F. sample. This is illustrated in Figure I.

In the chronic drunkenness offender population as in the general population, the rate of death increases with age. In Table XIII-9, the actual deaths in the chronic offender sample (1940-1961) and in the Ontario male population (1951) are converted to rates per 1000 males in each age class. The only notable exception to the pattern of progressively higher death rates with increasing age (Figure 2) is the decline in the death rate of the C.D.O.s between 45-49 years, an anomaly that might disappear if a much larger sample were employed.

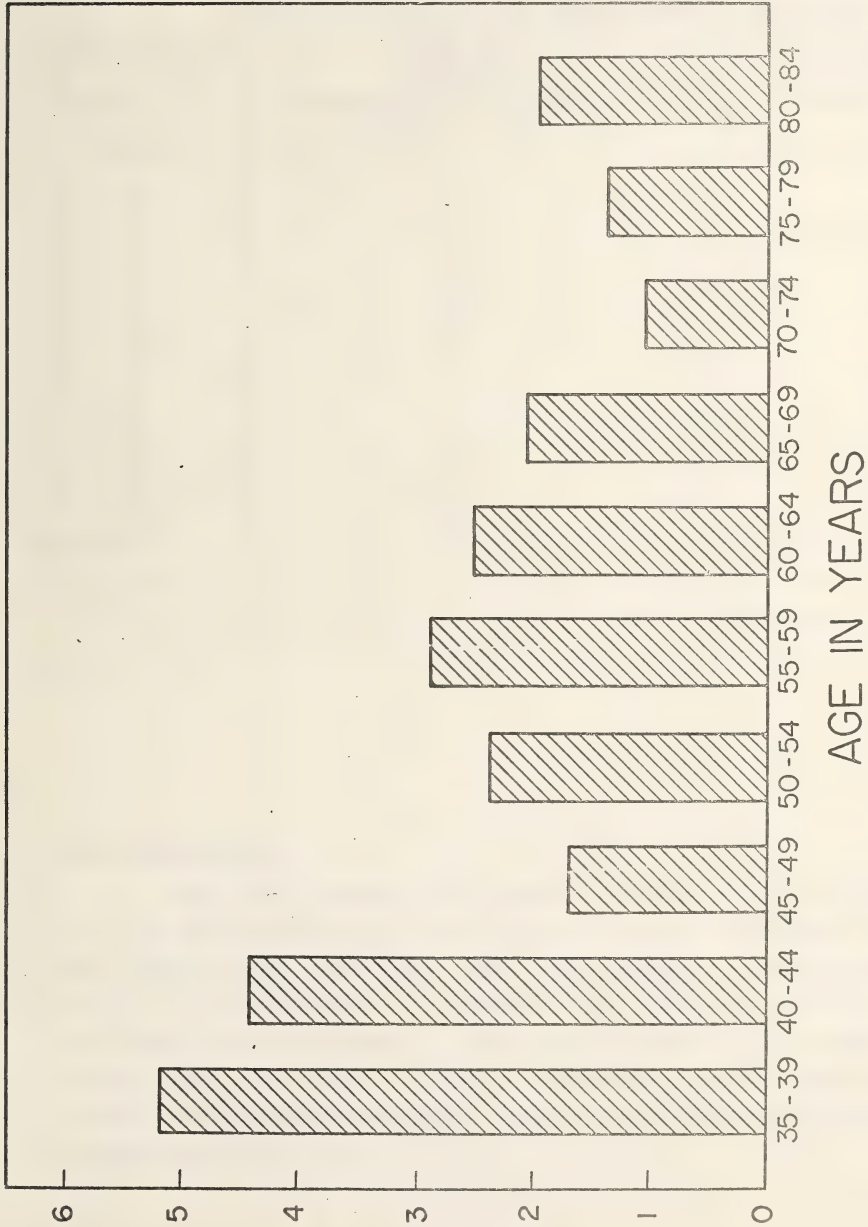
TABLE XIII-8

ACTUAL AND EXPECTED DEATHS OF C.D.O.S AND MALE ALCOHOLIC CLINIC PATIENTS BY AGE GROUPS

Age in Years	Number of C.D.O.S Exposed to Risk of Death (Ex) (man years)	Probability of Dying: Ontario Male Population ^a (qx)	Mortality Sample			A.R.F.Sample ^b Ratio
			Actual Deaths (dx)	Expected Deaths (dx)	Ratio (dx/dx')	
35-39	242	.00238	10	2.2	4.54	3.64
40-44	405	.00392				4.18
45-49	582	.00652	6	3.8	1.58	2.86
50-54	718	.01074	18	7.7	2.34	1.84
55-59	780	.01722	38	13.4	2.84	2.05
60-64	632	.02607	41	16.5	2.48	1.51
65-69	422	.03709	32	15.6	2.05	1.28
70-74	277	.05482	22	15.2	1.45	
75-79	125	.08643	17	10.8	1.57	1.18
80-84	24	.12936				
85 and over	7	.19985	7	4.5	1.55	
Total	4,214		191	89.7	2.13	2.03
p < .001						

^a Dominion Bureau of Statistics, 1951.^b A.R.F.Male Sample (Schmidt and de Lint, Table I, p.114). 18 deaths occurred under age 35.

RATIO ACTUAL (C.D.O.) / EXPECTED (ONTARIO) DEATHS



RATIO OF ACTUAL TO EXPECTED DEATH BY AGE GROUP

FIGURE XIII - I

TABLE XIII-9

COMPARISON OF DEATH RATES PER 1000 EXPOSED INDIVIDUALS BY AGE CLASSES

MORTALITY SAMPLE AND ONTARIO MALE POPULATION

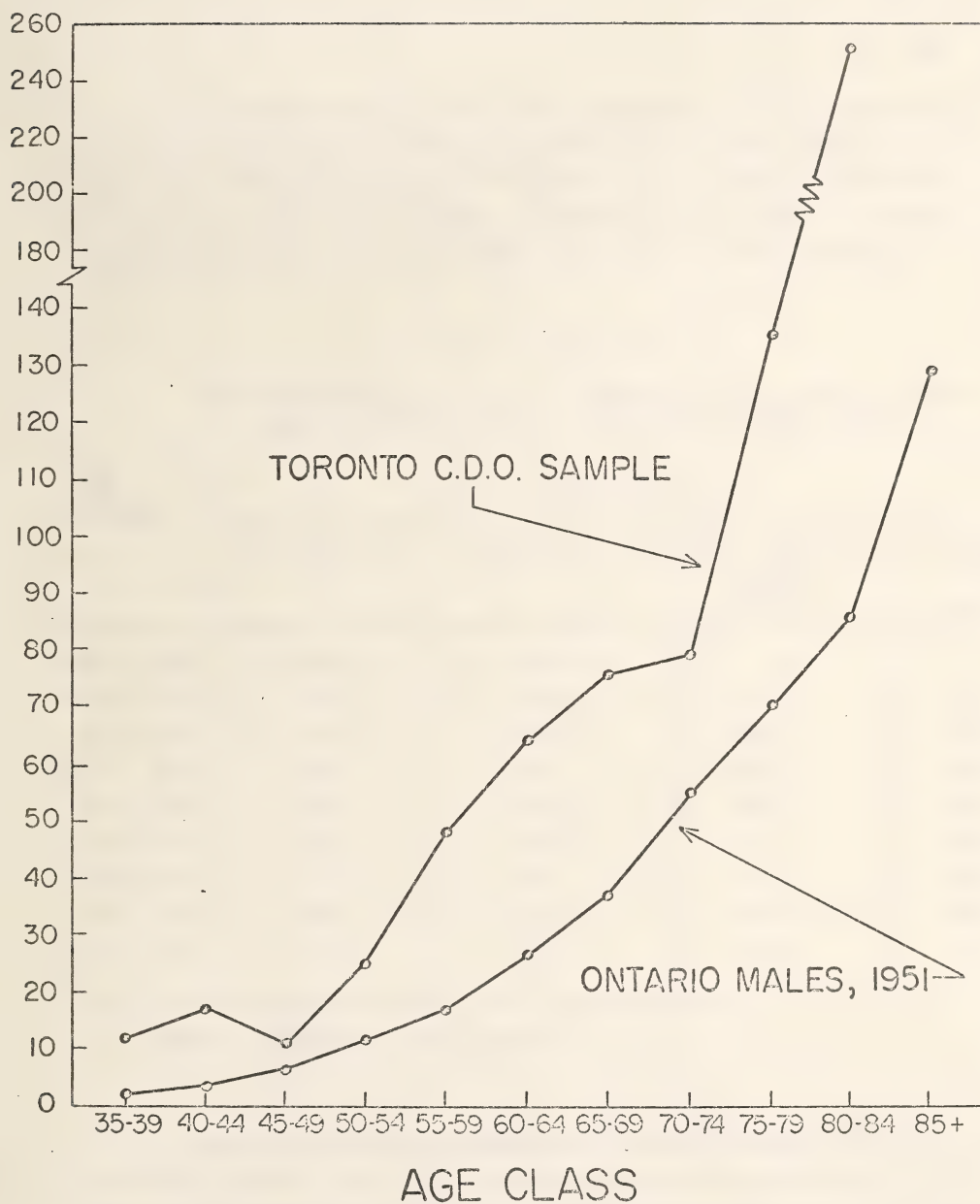
Age in Years	Death Rate of Chronic Drunkenness Offenders (1940 - 1961)	Death Rate of Ontario Male Population (1951)
35 - 39	12.4	2.4
40 - 44	17.3	3.9
45 - 49	10.4	6.5
50 - 54	25.1	10.7
55 - 59	48.7	17.2
60 - 64	64.9	26.1
65 - 69	75.8	37.0
70 - 74	79.4	55.0
75 - 79	136.0	86.4
80 - 84 ^a	250.0	129.1

^a Only one death occurred after age 84 (at 91 years).

Life Expectancy

The C.D.O. mortality sample and the Ontario male population may also be compared in terms of the average number of years of life remaining at each age. The life expectancy of the mortality sample is calculated from 37 years, the earliest age of death in the sample, and is based on the ages of death of the 191 men known to have died from 1940 to 1961. A description of the method and a table of life expectancy by single years of age are contained in Appendix I.

DEATH RATE PER 1,000 PERSONS



COMPARISONS OF DEATH RATES PER 1,000 BETWEEN TORONTO C.D.O. SAMPLE AND ONTARIO ADULT MALES, 1951.

FIGURE XIII - 2

In Table XIII-10, the life expectancy of the mortality group and the Ontario males is stated as the mean number of years of life remaining at the beginning of each age interval, in order to make the findings comparable with Bogue's figures for Chicago's Skid Row and white males in the United States.

TABLE XIII-10

LIFE EXPECTANCY OF C.D.O.S COMPARED WITH ONTARIO MALES,
CHICAGO SKID ROW MEN, AND UNITED STATES MALES

Age Groups	Years of Life Remaining			
	Ontario Males 1951	Toronto C.D.O.s 1940-61	Chicago Skid Row White Males ^a 1956-57	U.S.White Males ^a 1956
37 - 39	34.8	26.0	-	-
40 - 44	32.0	23.4	16.6	31.6
45 - 49	27.6	19.2	13.2	27.3
50 - 54	23.4	14.7	10.6	23.1
55 - 59	19.6	11.1	9.1	19.3
60 - 64	16.1	8.8	7.4	15.9
65 - 69	13.1	7.1	6.4	12.9
70 - 74	10.3	5.5	5.0	10.3
75 - 79	7.8	3.7	3.6	7.9

^a Bogue, Skid Row, (13), p.228.

Toronto chronic drunkenness offenders appear to have a life expectancy lower than the general Ontario male population (which approximates the United States white male population). At every age the C.D.O. can expect to have fewer years of life left to him than can a member of the general adult male population.

The Toronto C.D.O.'s life expectancy is higher than that for the Chicago Skid Row population, although it is closer to it than to the normal population. The proportionate difference in life expectancy between the C.D.O.s and the men on Chicago's Skid Row diminishes with age and becomes negligible at 75 years of age; whereas the ratio of the life expectancy of Ontario males to that of the C.D.O.s increases with age, as does the life expectancy of United States white males with the Skid Row men.

Since we do not have the statistics we cannot say that the Toronto chronic drunkenness offender has a higher life expectancy than the Toronto Skid Row man, only that he has a higher life expectancy than the Chicago Skid Row man. Nevertheless, assuming that the men on both Skid Rows are subject to the same hazards that go with the homelessness and hostel-type existence of Skid Row living (malnutrition, greater exposure to weather and to contagious diseases in crowded and/or unsanitary lodgings, lack of medical attention) and assuming there is no major relevant intervening factor - both reasonably valid assumptions - then we can say that the life expectancies of men on both Skid Rows are probably similar. We know that 90 per cent of the chronic drunkenness offenders (1960 sample) are also Skid Row men. Thus the C.D.O. sub-group differs from the larger group in having a longer life expectancy.

It also follows that the life expectancy of Toronto C.D.O.s and Toronto Skid Row men in general, converge with increasing age. This fits the known fact that the older a chronic offender is the more likely he is to lead a fully Skid Row existence when outside of jail, even though he is also likely to spend more time in jail.

These conclusions at least partly confirm our hypothesis that the chronic drunkenness offender is likely to have a longer life span than other Skid Row inhabitants because of the beneficial effects of his frequent stays in jail.

Survival Rates

The differences in survival rates between the chronic drunkenness offender sample and an Ontario male population of the same average age can also be used to describe the higher mortality of the inebriates. The survival rate for the sample is the proportion of the original group exposed to the risk of death who are known to remain alive at yearly intervals after 1940. Since some members of the original sample were lost from observation while still alive, an adjustment factor has been used to arrive at the approximate number of persons actually exposed to the risk of death during each twelve-month period.

The cumulative survival rate of the Ontario male population of the same average age, and subject to the same rate of loss of members as the disappearance from observation of men in the sample, may be regarded as an expected or theoretical survival rate for the sample.

In Table XIII-11 the **findings** are compared with the cumulative five-year survival rate reported by Tashiro and Lipscomb for 1,692 individuals admitted to four selected California alcoholism treatment facilities (as described above).

The actual cumulative survival rate is lower than the theoretical rate based on the general population and the disparity, of course, increases with passage of time. The California five-year rate and the equivalent figures for the Toronto chronic offenders correspond closely, although probably a majority of the California sample are alcoholics of a higher social status than the Toronto chronic drunkenness offenders.

TABLE XIII-11

Actual and Expected Survival Rates of Toronto Chronic Drunkenness Offender Sample, 1940-1961, and Actual Survival Rate of California Treated Alcoholics, 1954-1958.

Interval in Years	Toronto C. D. O. s			California Alcoholics
	Number Alive at Start of Period	Expected Cumulative Survival Rate	Actual Cumulative Survival Rate	Actual Cumul- ative Survival Rate
1	343	0.9914	0.9746	0.9725
2	304	0.9827	0.9425	0.9450
3	292	0.9732	0.9294	0.9263
4	285	0.9628	0.8935	0.9059
5	273	0.9515	0.8803	0.8778
6	268	0.9391	0.8376	
7	255	0.9257	0.8178	
8	248	0.9111	0.7813	
9	232	0.8954	0.7474	
10	218	0.8786	0.7151	
11	205	0.8604	0.6790	
12	189	0.8412	0.6465	
13	177	0.8207	0.6131	
14	162	0.7989	0.5940	
15	155	0.7764	0.5634	
16	145	0.7530	0.5323	
17	137	0.7288	0.4973	
18	128	0.7036	0.4736	
19	119	0.6773	0.4412	
20	108	0.6512	0.4160	
21	97	0.6242	0.3527	

Insofar as we have been able to compare our mortality group with the general male population and with other alcoholic and Skid Row groups, our findings agree with the bulk of the literature, that alcoholism is related to a high death rate and shortened life span. Moreover, as we hypothesized at the outset, the rates of death for our C.D.O. group differ from both Skid Row and other alcoholic populations. Presumably the numerous short stays in jail which are part of the revolving door way of life reduce exposure to physical damage on Skid Row and provide enforced periods of sobriety and recuperation.

The revolving door appears to mitigate the effects of Skid Row more than the effects of alcoholism. Most of the chronic drunkenness offenders are also Skid Row-ers, yet their mortality experience resembles the alcoholic groups in the Addiction Research Foundation and Lipscomb samples more than the Skid Row sample, even though the alcoholics in both groups are probably of a different socio-economic group than the C.D.O.s.

In short, alcoholism seems to be a more important factor in determining the mortality pattern of the Toronto chronic drunkenness offender than is the Skid Row way of life. We will test this conclusion further in our examination of the causes of death and comparison of morbidity patterns with the other groups.

CAUSES OF DEATH

We have established that chronic drunkenness offenders have a shorter life span than the general population and higher rates of mortality in all age groups from 35 years on. Alcoholism appears to be a major factor in the accelerated rates since the overall mortality picture resembles other alcoholic groups more than it resembles the Skid Row group with which it was compared.

A review of the literature indicates a considerable difference in the distribution of attributed causes of death between alcoholics and the general population. Because chronic alcoholism, or at any event excessive drinking, is a characteristic of our entire sample population, we would expect the death rates for various causes to differ from the general adult male population of Ontario in the same direction as those of other alcoholics.

The literature on Skid Row also shows that Skid Row living is connected with a different distribution of death causes from the rest of the population. We might have expected a similar distribution of deaths from certain causes in our group of C.D.O.s if our previous findings had not indicated that the revolving door seemed to offset the effects of Skid Row conditions with this group.

It is logical to expect, however, that the distinctive way of life of the chronic drunkenness offender will result in a somewhat different distribution of causes of death than that of the general male population, and probably of other alcoholic populations who escape the revolving door - as well as non-alcoholic Skid Row groups.

Review of the Literature

Many authors who have examined the causes of deaths of alcoholics report overwhelmingly higher figures for accidents of all kinds (14, 23, 24, 30, 37, 108, 123, 125).

Accidents and Suicide.- Tashiro and Lipscomb (123) found that 24 per cent - more than twice the percentage of California residents generally - of the alcoholics studied died 'violent' deaths - both accident and suicide. Brenner (14), using a sample of 1,343 persons admitted to the same four California treatment facilities during 1954-57, found that alcoholics were 7 times as likely to become the victims of some type of fatal accident as were residents of the Bay Area Counties (from which most of the sample came).

Among the frequent types of accidental fatalities are: poisoning (14, 123) which Brenner found was more likely to be 30 times as great for alcoholics as for normals; drowning (24); motor vehicle accidents (14); and accidental falls (14).

Dalhberg and Dahlgren (23, 24) in Sweden, and Brenner (14) all found a marked over-representation of deaths by suicide in their studies of alcoholics. Dahlgren suggests that the high rate of suicides is a gauge of the psychologically and socially injurious effects of alcohol. Saareheimo (108) points out that we should be cautious in directly relating suicide to alcoholism since the decision to commit suicide may be made while the individual is sober and alcohol used to instil courage; or the suicide may be a result of the severe depression often associated with a hangover.

Brenner relates the high death rate due to accidents to personality characteristics. Suicidal tendencies, for example, may be expressed simply by not making the necessary life saving effort, or by not refraining from dangerous activities.

Sundby also found an excess rate of suicide among alcoholic patients, which he suggests may indicate "that the spasms of depression and remorse so often seen in the hang-over period are more serious than is usually believed" (p.158).

However, Sundby's vagrant group of alcoholics (see p.6) was no more likely to commit suicide than alcoholics in general (122).

He also found a high mortality rate from accidents. He notes that the alcoholic is characteristically accident prone, partly because of personality problems and partly directly due to drunkenness when his co-ordination is poor and he indulges more readily in risk-taking behaviour. Vagrants, he found, have an even higher death rate from accidents than non-vagrants.

Bogue found a higher than expected rate of deaths from accidents and violence on Skid Row (4.50 per 1,000 compared to 1.50 among the general male population of the United States).

Circulatory Diseases.- Tuerk and Gorwitz (125) found heart disease was the main cause of death among their alcoholic groups (29% in both cases). Kuller (61) found 49.5 per cent of deaths among 20 to 39 year old alcoholics due to this condition.

Wilens (138) and Nolan (88) both found in their investigations of circulatory disease that arteriosclerosis and cardiovascular accidents are less frequent among alcoholics than among non-alcoholics. Hirst (45) says that these findings hold only for alcoholics who have developed cirrhosis of the liver. He explains that conditions such as nutritional deficiency, which are conducive to the development of cirrhosis, retard the

development of arteriosclerosis. Sjövall (117) also states the indications are that arteriosclerosis is rarer among alcoholics.

Gabriel (34) found that among persons released from treatment for alcoholism, those who returned to a pattern of heavy drinking had a higher proportion of deaths from heart disease than did those who remained abstinent. His findings on arteriosclerosis, however, verified those mentioned above in that the proportion of deaths from arteriosclerosis was higher for the group of abstainers.

Most medical textbooks (for example, Beeson's [9]) recommend that it is advisable to reserve judgment on the role of alcoholism as it relates to cardiopathy, since the mechanisms by which alcohol may cause irreversible damage have not been identified (9, p.755). It is stated that cardiac disorders are rarely due primarily to alcoholism and its related nutritional deficiencies, although existent heart disease may be aggravated by the abnormal living habits of the alcoholic (p.1733).

Cancer.— Various reports in the literature indicate that certain cancers are related to excessive drinking. Studies in Scandinavia, France, England and the United States have found that alcoholics and heavy drinkers have a high susceptibility to cancer of the larynx and pharynx, of the oesophagus and of the mouth (84, 115, 130, 140, 141, 142). It is an observed fact that heavy drinkers tend to be heavy smokers (113, 140, 141, 142) and these cancers, with the possible exception of the oesophagus (141) are also related independently to smoking. However, there seems no doubt that heavy alcohol consumption is a significant factor in the development of these cancers.

Several studies have shown that a high incidence of cancer of the liver occurs in alcoholics with liver cirrhosis (17,66,67, 122). On the other hand, alcohol does not seem to influence the development of gastric carcinoma (129) or cancer of the lung, head, neck or urinary tract (141). Dahlgren (24) found that tumours (he does not specify their location) occurred among alcoholics more frequently than expected, although the difference was not statistically significant.

Sundby, who also found a significant excess mortality among his alcoholics due to cancer of the larynx and upper alimentary tract, found no differences between his vagrant and non-vagrant groups in this respect. Bogue noted a death rate from cancer on Skid Row higher than that for the general U.S. male population, although he does not tell us which types of cancer are more prevalent or suggest what factor or factors in Skid Row living might be linked to cancer development and mortality.

Respiratory Diseases.- Gorwitz et al. (38) found that pneumonia and bronchitis tied with malignant neoplasms as fourth highest cause of death among Maryland patients with a diagnosis of alcoholism. (Eight per cent died from these causes.)

In 1934 Malzberg (75) studying mortality among patients with alcoholic psychoses found that pneumonia accounted for 20.5 per cent of the deaths. Another study (83) of a sample of patients with delirium tremens at Boston City Hospital discovered 24 per cent of the deaths resulted from pneumonia (second to D.T.s - the leading cause). Alcoholism and death from pneumonia were inter-related in a French study of the effect of the consumption of wine and alcohol on certain diseases (64).

We must bear in mind, however, as Sundby (122) points out, that a diagnosis of pneumonia is not reliable as a cause of death since a variety of causes may be hidden behind this terminal illness.

Evans and Gray (29) found while reporting on 217 cases of Laennec's cirrhosis in 1938 that there were 80 cases of death from respiratory diseases, approximately one out of every three.

Jellinek (53) refers to the long accepted fact that chronic alcoholics display a disregard for, and have a reduced resistance to, cold and are therefore highly susceptible to respiratory diseases.

In his study of alcoholism in Chile, Alessandri (2) concluded that alcoholism had a definite and adverse effect on the respiratory processes.

Regarding respiratory disease on Skid Row, Bogue says:

Pneumonia among homeless men is a by-product of long-continued exposure to the elements, poor diet, inadequate clothing, or excessive drinking. In the winter, almost everyone on Skid Row has a cold. (13, p.229).

Infectious Diseases - Tuberculosis.- Dahlberg (23) mentions tuberculosis as one of the two causes of death (suicide was the other) producing an especially high death rate in his sample of alcoholics in Sweden.

Tuerk and Gorwitz (125) found that TB was overrepresented as a cause of death among alcoholics in Maryland as opposed to the general population. Yershov (143), studying 100 alcoholics with pulmonary tuberculosis who spent from 1 to 15 years at the dispensary, concluded that alcoholism aggravates the course of TB.

Arnould (6), from his study of death rates from tuberculosis, liver cirrhosis and alcoholism in the United States over a 22-year period, came to the opposite conclusion: that the statistics indicate alcoholism does not play a decisive role in the development of tuberculosis.

Rhodes and Hudson (105) point out that tuberculosis is a residual disease concentrated among people who do not live by adequate health standards, and that Skid Row alcoholics in North America contribute disproportionately to this T.B. concentration. This has been further demonstrated by Olin and Grzybowski (90),

who found a significantly higher prevalence of tuberculosis infection among a sample of jailed chronic drunkenness offenders than among inmates of the same jail committed for other offences. Also, tuberculous infection was much more common (80% of the C.D.O.s reacted positively to the tuberculin test as compared to 33% of the other inmates). These authors feel that the overcrowding and unsanitary conditions of flophouses and jails, an observed difficulty in keeping alcoholics in TB sanatoria for any length of time, and the low standard of living associated with poor nutrition of the C.D.O.s, all combine to reduce the chronic offenders' resistance to infection.

Diseases of the Digestive System.- Among digestive diseases it is generally cirrhosis of the liver that is associated with alcoholism. Laennec's cirrhosis is considered to be a disease of the alcoholic: of the patients who are hospitalized for this condition, three-quarters are alcoholic, and of the alcoholics who are hospitalized 20 per cent suffer from this condition (9, p.939). Whereas formerly it was considered to be a disease resulting from prolonged malnutrition, there appears to be increasing evidence that alcohol, consumed over a long period and in large quantities, is the prime hepatotoxic agent (190). There is nevertheless considerable controversy as to the role of dietary factors or nutritional imbalance in the pathogenesis of Laennec's cirrhosis (116). Gorwitz et al. (38) found cirrhosis to be the second highest cause of death (13%) among Maryland alcoholics, and others (37, 25) have found it connected with higher mortality than in the general population. Brenner (14) estimates from his study of alcoholics in California that they are ten times more likely to die of cirrhosis or stomach ulcers than the general population.

Alcoholism.- Death directly connected with alcoholism is likely to be underestimated in statistics compiled from death certificates, according to several authors. In a survey conducted in a New York State county health district, Nicoll and Bellows (86) showed the degree to which other primary causes of death were stated on original certificates where alcoholism should have been included. Diseases of the heart, acute and chronic nephritis, cerebral haemorrhage, cerebral embolism and thrombosis were cited most often as the incorrect cause most frequently entered on death certificates. In 1939 the United States Bureau of Census estimated that the frequency

of death from alcoholism was probably underestimated by at least one half. In 1952, Moore et al. (82) found that deaths due to alcohol were about 2.8 times as frequent as listed in official statistics in Massachusetts. More recently, in 1956, a report by the WHO of causes of death (139) states that alcoholism was not often certified as a cause of death when the apparent cause was, for example, pulmonary disorder, cerebral haemorrhage, suicide, or traffic accident.

Tuerk and Gorwitz (125), nevertheless, found alcoholism over-represented as a cause of death among alcoholics in Maryland. Dahlgren in Sweden (24), on the other hand, does not list alcoholism as a cause of death among 10,616 alcoholics reporting to the Temperance Board.

Tuyns (126) examined mortality from alcoholism in Belgium. He concluded that death from alcoholism has declined since 1901, partly because severe drunkenness was more prevalent then than now when people drink smaller amounts or less concentrated beverages. He also thinks the physician feels freer in recent years to specify alcoholism as the true cause of death, which he suggests accounts for a rise in 1954 and 1955 in Belgium's alcoholism deaths. He shows that mortality from alcoholism increases steadily up to the age of 60, after which it levels off, unlike death from cirrhosis which continues to increase with age.

Schmid (110) also found in 1940 that mortality from alcoholism had declined greatly since the beginning of the century. The peak of mortality from this cause occurs (in men) in the 50 to 54 year age group. A further steady decline in death rates from both acute and chronic alcoholism is described in a report of the Metropolitan Life Insurance Company in 1952 (28).

Source of Information

The data were drawn from the death certificates of the 191 men in our sample who were known to be dead. Where the previous history of the patient is unknown to the certifying physician and no autopsy is performed, death certificate information may be regarded with a certain amount of skepticism. Most chronic drunkenness offenders are likely to be strangers to the physicians who treat their terminal illnesses and injuries, and few, judging from the small number of informants listed on death certificates as relatives, have families at hand to provide information. Autopsies were noted on only 48 (25.13%) of the 191 death certificates.

On the other hand, the death certificates of homeless, unattached men are probably not biased by the alleged tendency of physicians to protect the feelings of the deceased's relatives where conditions regarded as shameful are involved. Alcoholism or suicide are therefore likely to be identified as such if the certifying physician knows of them.

The primary cause of death (i.e. the "disease or condition directly leading to death") was taken directly from the death certificate. However, in a few cases ambiguities or inconsistencies forced a review of medical records from the hospitals where death had taken place.

In all we found that 22 (11.52%) of the death certificates were of highly doubtful accuracy and neither medical reports nor coroners' reports were either available or helpful enough to complete them. These were not used in the analysis. Although it is possible this might result in skewed distribution, examination of these certificates would not suggest a bias in favour of any one disease.

Some of the difficulties that exist in classifying highly specific causes of death disappeared when the individual causes were combined into classes of causes under major functional systems of the body, major disease categories and certain types of fortuitous injury, following the International Statistical classification (77). Most of the comparisons in the study are either in terms of these broad groupings, or some narrower categories of common diseases such as cancer, pneumonia or tuberculosis.

The analysis that follows is based on 169 deaths.

Deaths from All Causes

In Table XIII-12, a percentage breakdown of chronic offenders by major categories is compared with a similar breakdown for the Ontario male population, 35 years and older. The chronic offenders have a markedly higher (more than double) proportion of deaths in three categories: (1) accidents, poisonings and violence (2) diseases of the respiratory system, and (3) diseases of the digestive system. When specific causes of death within these three categories are further specified in Table XIII-13⁶ it is apparent that accidents, pneumonia and peptic ulcers play a large role and these account for virtually all the significant differences where C.D.O. causes of death exceed those found in the general population. On the other hand, diseases of the nervous system and sense organs are twice as large in the normal population.

The percentages and rate of death from selected causes frequently studied in relation to alcoholism are stated in Table XIII-14 for the chronic offender sample and the Ontario male population. The chronic offender death rates are more than double those of the general population in the following categories: ulcers of the stomach and duodenum, pneumonia and bronchitis, and accidents. The chronic offenders have lower rates only for vascular lesions of the central nervous system, diseases of the heart, and cancer.

⁶ It is important to note that direct comparisons cannot be made in the next five Tables because categories differ.

TABLE XIII-12

CAUSES OF DEATH OF CHRONIC DRUNKENNESS OFFENDERS (1940-1961)
AND ONTARIO MALE POPULATION, 35 YEARS AND OLDER (1951)
BY MAJOR DISEASE CATEGORIES

Cause of Death	Chronic Offenders		Ontario Males ^a %	Difference ^b %
	Number	%		
Diseases of circulatory system	65	38.5	47.8	-13.3*
Accidents, poisonings, and violence	23	13.6	6.2	7.4**
Neoplasms	22	13.0	15.1	- 2.1
Diseases of respiratory system	19	11.2	5.3	5.9**
Diseases of digestive system	13	7.7	3.1	4.6**
Diseases of nervous system and sense organs	11	6.5	13.4	- 6.9***
Infective and parasitic diseases	5	2.9	2.1	0.8
Diseases of the genito-urinary system	4	2.4	2.9	- 0.5
Allergic disorders and endocrine, metabolic and blood diseases	3	1.8	2.4	- 0.6
Total	169			

* Significant at the .05 level.

** Significant at the .001 level.

*** Significant at the .02 level.

^a Dominion Bureau of Statistics, 1951.

^b Chi-square "goodness of fit test".

TABLE XIII-13
CAUSES OF DEATH OF CHRONIC DRUNKENNESS OFFENDERS WITHIN
THREE CATEGORIES OF UNUSUAL RISK

Cause of Death	Number
1. Accidents, poisonings and violence:	
Accidents (vehicular, falls, drowning, etc.)	19
Alcohol poisoning	1
Suicide	2
Murder	1
2. Diseases of the respiratory system:	
Pneumonia	12
Chronic bronchitis, asthma and emphysema	4
Other	3
3. Diseases of the digestive system:	
Benign peptic ulcers	9
Cirrhosis of liver and complications	2
Intestinal obstructions and hernia	2
All other known causes	114
Total	169

TABLE XIII-14

PERCENTAGE OF TOTAL DEATHS FROM SELECTED CAUSES AND CRUDE DEATH
RATE PER 1,000 CHRONIC DRUNKENNESS OFFENDERS AND
ONTARIO MALES 35 YEARS AND OVER, (1951).

Cause of Death	Per Cent		Rate	
	C.D.O.	Ontario ^a	C.D.O.	Ontario ^a
Diseases of the heart	30.4	44.3	7.7	10.2
Accidents	9.9	4.9	2.5	1.0
Poisoning	0.5	0.3	0.1	0.4
Suicide	1.0	1.1	0.2	0.2
Cancer	11.5	15.2	2.9	3.2
Pneumonia and bronchitis	7.3	4.6	1.9	0.7
Tuberculosis	1.6	1.5	0.4	0.3
Ulcers of stomach and duodenum	4.7	1.0	1.2	0.3
Alcoholism	2.4	0.4	0.7	.03
Cirrhosis of liver	1.0	0.6	0.2	0.1
Vascular lesions of the central nervous system	5.7	12.5	1.4	2.6

^a Dominion Bureau of Statistics.

TABLE XIII-15

COMPARISON OF MORTALITY RATIOS OF CHRONIC DRUNKENNESS OFFENDERS AND ADDICTION RESEARCH FOUNDATION PATIENTS WITH ONTARIO MALE DEATHS

Cause of Death	C.D.O. Ratio (Respective Rate per 1,000)	A.R.F. Ratio ^a (Observed/Expected)
Diseases of the heart	0.8	1.78 ^b
Accidents	2.5	2.11
Poisoning	0.2	11.37
Suicide	1.0	6.02
Cancer	0.9	1.33
Pneumonia and bronchitis	2.7	3.07 ^c
Tuberculosis	1.3	-
Ulcers of the stomach and duodenum	6.0	3.55
Alcoholism	23.3	24.00
Cirrhosis of the liver	2.0	11.49
Vascular lesions of the central nervous system	0.5	1.14

^a Schmidt, W. and deLint, J., "Causes of Death of Alcoholics," (113, Table 3, and the figures for Accidents and Poisoning from personal communication.)

^b Includes only arteriosclerotic and degenerative heart disease for the A.R.F. sample.

^c Pneumonia only.

TABLE XIII-16

DEATH RATES PER 1,000 FOR THE MAJOR CAUSES OF DEATH: YEARLY AVERAGE FOR THE TORONTO CHRONIC DRUNKENNESS OFFENDER SAMPLE, AND 1951 RATE FOR THE ONTARIO MALE POPULATION OVER 35 YEARS OF AGE.

Cause of Death ^a	C.D.O. Death Rate per 1000		Rate	Ratio
	Simple Rate	Age Standardized	Ont. Males Over 35	C.D.O. Rate to Ont. Rate
Circulatory diseases	8.58	15.18	10.12	1.50
Accidents, poisoning, violence	3.03	1.59	1.32	1.20
Cancer	2.90	4.14	3.00	1.38
Respiratory diseases	2.51	5.45	1.13	4.82
Digestive diseases	1.71	4.93	.65	7.58
Nervous and sensory disorders	1.45	2.85	2.85	1.00
Infective and parasitic diseases	.66	1.22	.33	3.70
Overall	25.3	47.91	21.2	2.26

Age Standardization: The age specific death rates for the standard population (Ontario males 1951) are multiplied by the number of sample members in each age class as in Table XIII-8, these products are then summed to yield the total number of expected deaths; this sum is divided into the total number of observed deaths and the quotient is multiplied by the overall rate for the standard population.

^a According to the International Classification of Diseases (77).

Circulatory System

The disease category which accounts for the highest death rate among chronic drunkenness offenders is also the chief cause of death in the normal population. In fact, diseases of the circulatory system take a higher toll (47.8%) of Ontario males than of C.D.O.s (38.5%), (Table XIII-12). The simple death rate, then, indicates that there is little or no relationship between chronic drunkenness⁷ and death from circulatory disease.

However, since the chronic drunkenness offender has a shorter life expectancy than the normal population, there are proportionately fewer men in the age groups that are high risk classes for the normal population. When we standardize the figures for age, we find that the yearly average rate is half again that for Ontario males.

The Toronto sample has a much lower rate than Bogue's Skid Row group (Table XIII-17), although considerably higher than Lipscomb's alcoholic group. The difference between the Toronto and Lipscomb samples might, however, be lessened if the latter had included cases of other circulatory diseases. At any rate, the figures are in general agreement with the school of thought in the literature cited that claims arteriosclerosis and cardiovascular accidents are less frequent among alcoholics (although other circulatory disease may not be).

It appears from Bogue's figures that there is a definite relationship between the Skid Row way of life and death from circulatory disease - perhaps because the Skid Row way of life violates the rules of good heart care (for example, regular vigorous exercise, rest, proper diet).

⁷ That is, chronic drunkenness as manifested by chronic drunkenness offenders.

TABLE XIII-17

YEARLY AVERAGE DEATH RATES PER 1,000 FOR EACH MAJOR CAUSE OF DEATH FOR THE TORONTO CHRONIC DRUNKENNESS OFFENDER SAMPLE, BOGUE'S SKID ROW SAMPLE, AND LIPSCOMB'S ALCOHOLIC SAMPLE.

Cause of Death	Bogue's ^a Skid Row Sample	Toronto C.D.O. Sample	Lipscomb's ^b Sample
Circulatory Diseases	37.90	8.58	3.72 ^c
Accidents, poisoning, and violence	4.50	3.03	3.57
Cancer	4.90	2.90	1.19
Diseases of the Respiratory system	4.77	2.51	.60
Diseases of the Digestive system (except liver cirrhosis)	.63	1.45	.90
Cirrhosis of the liver	1.57	.26	1.64
Diseases of the nervous system and sensory organs	3.20	1.45	1.19
Infective and parasitic diseases	4.53	.66	.45

^a Bogue, Skid Row (13, p.228).

^b Tashiro and Lipscomb, "Mortality Experience of Alcoholics," (123, Derived from Table 3, p.207).

^c Heart disease only.

TABLE XIII-18

COMPARISON OF RATIO OF DEATH RATES OF CHRONIC DRUNKENNESS
OFFENDER SAMPLE / ONTARIO MALE POPULATION, TO RATIO OF DEATH RATES
OF SUNDBY'S VAGRANT PATIENTS / NORWEGIAN POPULATION,
FOR SELECTED CAUSES.

Cause	Ratio of C.D.O. Death Rate to Ontario Male Death Rate	Ratio of Vagrant Death Rate to Norway Death Rate
Circulatory disease	.84	1.28
Accidents, etc.	2.30	3.93
Cancer	.96	2.26
Respiratory disease	2.22	2.77
Digestive disease	2.63	2.44

On the other hand, as we have suggested throughout this study, the revolving door process presumably plays a role in maintaining the health of the individual, since the C.D.O.s, 90 per cent of whom are also Skid Rowers, have a much lower rate of death from circulatory disease than Bogue's sample (which, incidentally, is very much higher than that of the United States adult male). In other words, the C.D.O. sample resembles much more an alcoholic sample than a Skid Row sample.

Sundby, who also found a lower death rate for circulatory disease among his vagrant group than non-vagrant group of alcoholics, offers a different explanation. He suggests that the vagrants suffer greater nutritional deficiencies, making them less susceptible to influences (such as overeating) that are conducive to vascular degeneration. These two positions are not, however, mutually exclusive: the C.D.O. is certainly not an over-eater (over 75 per

cent of the 1961 C.D.O. sample were under the Canadian average weight, although almost 90 per cent gained an average of 6 pounds while in jail (see Chapter XII, Physical Health, p.42) and it may be that both factors are effective in determining mortality.

Accidents, Poisoning and Violence

This major category of causes of death does not only account for the second highest number of deaths among chronic drunkenness offenders, but it represents the highest rate of deaths when compared to the general male population. We suspect this is due to a combination of his alcoholism and his Skid Row existence. The findings in the literature showed that accidents accounted for a high proportion of alcoholics' deaths. The C.D.O. is drunk much of the time when he is out of jail, a state characterized by lack of motor control and judgment. Thus he is particularly susceptible to falling down stairs, wandering into traffic, exposure to the elements, or accidental drowning. If he is with companions they are likely to be in the same condition and therefore not able to protect him from danger.

Since chronic drunkenness offenders are older on the average than the general male population, the high proportion of death rates from accidents might be considered due to the difference in age distribution. However, when we control for age we find that the C.D.O.s still have a much greater likelihood of dying from accidental causes (Table XIII-16).

In our sample, of the 23 men who died from accidents, poisoning or violence, 8 (34.7%) died in motor vehicle accidents (7 as pedestrians); 5 (21.7%) from falls; 6 (26.0%) from other accidental causes; and 1 (4.3%) from poisoning.

In Bogue's sample, falls accounted for the greatest number and motor vehicle accidents the second highest number. The death rate from falls for the C.D.O. is .66 per 1,000, and for Bogue's sample 1.76. For motor vehicle accidents our sample has a death rate of 1.05 and Bogue's a rate of .867. This indication that the men in the Toronto sample are more prone to traffic accidents is not unexpected. Chicago's Skid Row is a much more contained area than the Toronto Skid Row district and the men in Toronto are more likely to wander unfamiliar or busy streets. Also, motorists are not as aware of Skid Row in Toronto. The higher death rate due to falls in Bogue's sample indicates a greater likelihood of finding more infirm men in a general Skid Row sample than in an alcoholic sample of Skid Row men.

Of the 10 deaths by motor vehicle in Lipscomb's sample, 5 were pedestrians, 3 were drivers and 2 were passengers - an indication that his sample contained persons of higher socio-economic status than our chronic drunkenness offenders.

Sundby too found that vagrants face a greater risk of accidental death than do non-vagrants. However, both groups of alcoholics had a very high death rate due to accidents. The underlying factor in all the accidental deaths was intoxication, not only in those deaths due to poisoning (40%) but also in the others where intoxication tended to be the initiating and aggravating factor. For example, in the 18 deaths in Sundby's sample from falls on the same level or from ladders, it appears that the victim was unable to protect himself while falling.

There was only one death from homicide in our sample. Bogue feels that the homicide rate for his sample would be higher were it not for the fact that many deaths actually resulting from injury done by "jack rollers" are attributed to falls. Our figures are probably accurate, however, since Toronto does not afford as many isolated, unpatrolled alleys or poorly policed enclaves where young hoodlums are able to get away with the jack rolling and beating up of drunks.

The suicide rate for the chronic drunkenness offender is also very low in contrast to all the other rates. Sundby, finding no variation in suicide rates between vagrant and non-vagrant patients, concluded that alcoholics in general are prone to suicide. Our figures and conclusion are quite different. Death rate per 1,000 is .2 for the Toronto C.D.O. sample, which is approximately the same as the rate for the adult males of Ontario (Table XIII-14). On the other hand, Bogue's Skid Row and Lipscomb's alcoholic death rates are both much higher than the U.S. male rate (.80 and .90 respectively, to .158).

The suicide rate for the Addiction Research Foundation group of alcoholic patients is 1.36 (113, Table 9) much higher than the .2 chronic drunkenness offender rate.

In this respect then, the chronic drunkenness offender differs from alcoholic and Skid Row groups and, in fact, seems unlike even Sundby's parallel group of 'vagrant alcoholics'.

It is difficult to assess the reason the Toronto C.D.O. group has such a low suicide rate in comparison to the other sample groups, although several possibilities come to mind. Insofar as depression might be the cause of suicide (as Saarenheimo, for one, suggests (108)) we would not expect the depression of a hangover to be much greater than the depression normally associated with the C.D.O.'s way of life. Nor does the pre-meditated act of suicide seem likely among a group of men who are so used to unplanned days. Possibly men who are on Skid Row because of unavoidable circumstances and who are not alcoholics may be more prone to depression leading to suicide, or may use suicide rather than alcohol to remove them from an unrewarding existence. The high rates in Lipscomb's and the A.R.F. samples may be a result of a depressed reaction to the downward mobility associated with alcoholism, or a number of other factors that would be found among middle and lower class alcoholics who still had ties with jobs and families.

It is possible the low rate is partly a matter of definition: what exactly is suicide? (For example, might a case of alcohol poisoning actually be a case of suicide?) The chronic drunkenness offender who has long been cut off from his family is much less likely to leave a note establishing suicide than a member of the higher socio-economic groups. Also, once again the revolving door may have some effect on mortality from this cause. Outside, the men are usually intoxicated or seeking the means of becoming so. Sobering up takes place in jail, where they are not isolated and any remorse or depression may be worked off in a fairly rewarding situation (see Chapter V, The Jail).

The death rate from accidents, poisoning, and violence together is highest for Bogue's sample (4.50 per 1,000). The C.D.O., Lipscomb's and A.R.F. samples are fairly close (3.56, 3.57 and 3.33 respectively). Although we can make no conclusive statement it does appear that the deaths in the C.D.O. sample, with the exception of suicide, are more a result of drunkenness than they are a result of factors that we would associate with a Skid Row population.

Cancer

The simple death rate for the C.D.O. from cancer, like the circulatory diseases, is very close to that of the normal population (2.9 for the C.D.O., and 3.0 for the Ontario male population) (Table XIII-14). However, the age standardized rate is somewhat higher, suggesting there may be a slight relationship between death from cancer and chronic drunkenness.

Deaths from cancer between the ages of 40 and 44 were abnormally higher in the sample than in the larger community. However, this was the only age grouping that manifested any significant variation from the normal. Most of the cancer deaths occurred between the ages of 55 and 69 (59.1%), a slightly younger age bracket than deaths from cancer in the Ontario male population.

Bogue's finding that the death rate from cancer in his sample is higher than that for the United States population suggests there is some factor in the Skid Row way of life that is conducive to the development of cancer. Since the chronic drunkenness offender sample shows a higher rate than Lipscomb's or the Addiction Research Foundation patients (although lower than Bogue's) we can probably support his conclusion.

Our review of the literature indicated that cancer of the respiratory organs, of the upper digestive tract and the liver appear to be linked with alcoholism.

Unfortunately we do not have a breakdown of the types of cancers causing death among Bogue's Skid Row men. Thus we do not know if our C.D.O. group resembles Skid Row by type of cancer, but we do know that it differs greatly from alcoholic groups in this respect. In our mortality sample, carcinoma of the stomach accounted for 8 (36.4%) of the 22 deaths from cancer; bronchogenic cancer for 4 (18.2%); and carcinoma of the pancreas for 3 (13.6%) - approximating the distribution of cancer deaths in the Ontario male population. There were 3 deaths (13.6%) from cancer of the prostate; 2 (9.1%) of the rectum and one (4.5%) of the gastrointestinal tract. There was no case of death from cancer of the oesophagus and only one (4.5%) from cancer of the larynx.

Cancer of the larynx, pharynx, mouth, and most particularly of the lung, have been closely related to smoking; all but lung cancer have also been related independently to alcoholism. The chronic drunkenness offenders, like most other alcoholics, are heavy smokers. Yet if we combine those alcoholism-related and smoking-related types of cancer we find they account for only one (4.5%) of the cancer deaths in our sample. In contradistinction we find that almost half, (48% or 37 of the 77) of cancer deaths among men in the A.R.F. study were of the respiratory tract (including lung cancer) and 12 (15.6%) were of the upper digestive tract. Only 7 deaths (9.1%) occurred from gastric carcinoma.

Moreover, we found no case of death from cancer of the liver. This is not surprising perhaps, considering the fact that only two men in the sample died of liver cirrhosis, and liver cancer is generally considered to be related to a cirrhotic liver.

It is interesting, however, that Schmidt and de Lint also found no case of liver cancer, even though 56 (8.75%) of the men in their sample died from liver cirrhosis. Whereas autopsies were seldom performed on the men in our group, so that errors in diagnosis might explain the absence of deaths from this cause, autopsies were performed in 55 per cent of the cases in the A.R.F. sample, making such errors less likely.

Sundby found a very pronounced ratio of alcoholic to normal population deaths due to malignant neoplasms. Of the 204 deaths from this cause, 67 (32.8%) were of the larynx and upper digestive tract, giving a mortality ratio of 11.68 when compared with Norwegian expectation. The number of deaths among patients for the tongue, oral cavity, pharynx and oesophagus are all 12 times higher than the

Norwegian expectation (and 4 times the Oslo one).

He then separated out his vagrant and non-vagrant groups and examined them in relation to the alcoholism-related cancers (in which group he included lung, larynx, tongue and oral cavity, pharynx, oesophagus, and upper digestive tract). Sundby reasoned that insofar as dietary factors may be pertinent to the development of these cancers according to WHO's experts on the prevention of cancer, then we might expect the vagrant alcoholics, who have probably been exposed to dietary deficiencies and non-beverage forms of alcohol more than the other patients, to differ in mortality from these cancers.

However, Sundby says this is not demonstrated (see his Table 25, p.96). If Sundby refers only to his last category, 'upper digestive tract', then there is not too much difference in the ratios (10.0 as compared to 12.52).⁸ If the pharynx is included, then it certainly shows a considerable difference between the vagrant and non-vagrant groups as to this one type of cancer.

Although on the basis of our findings we would not agree with Sundby's conclusion that "There is hardly any significant difference between the two groups for any of these causes" (p.97), we can agree with him that "the group that suffers the most serious social consequences of alcoholism shows no signs of being particular [sic] liable to die from these types of cancer."

⁸ We feel there are typographical errors in this Table. Column 5 should surely be labelled Dc/En. Pharynx ratio for vagrants should be 30.00, Oesophagus 10.00, and Upper Digestive should be 10.00.

In fact, our findings show that the C.D.O.s are highly unlikely to die from any of the cancers generally associated with alcoholism. They are very likely to die from gastric carcinoma, which is not considered to be associated developmentally with alcoholism (129).

These findings suggest that it is some area other than alcoholism in the C.D.O.'s life style that is related to the type of cancer which causes his death. His Skid Row existence may have some bearing on it.

Respiratory Diseases

The next highest death rate is in the category of respiratory diseases. Within this category pneumonia is the chief cause of death among the chronic drunkenness offender sample (Table XIII-13). The simple death rate for the sample is higher (Table XIII-16) than for the normal population (2.51 as compared to 1.13).

We would certainly expect from Bogue's description and our own observations, that the life the men lead on Skid Row would encourage the development of all kinds of respiratory diseases, from cold to pulmonary tuberculosis. The men are out of doors much of the time in winter and wet weather; they often sleep in cold, damp places; they are frequently in close confines with other persons who may be infected, and share relatively unsanitary living conditions with them.

Lack of a proper diet, which may be more characteristic of the chronic drunkenness offender than the Skid Row habitué, together with the heavy smoking also characteristic of the C.D.O. probably reduces resistance to infection.

Added to the C.D.O.'s living conditions are his drinking habits. According to the literature alcoholics are, for whatever reasons, very prone to respiratory diseases, to pneumonia in particular. Thus we would expect the effects of Skid Row living on mortality among C.D.O.s from this cause to be compounded by the effects of his alcoholism.

This does not appear to be the case from the comparisons seen in Table XIII-17. Skid Row living seems to have a much greater effect on death through respiratory diseases than does alcoholism. Actually, Lipscomb's rate of deaths from this cause is very low (.60) compared to other alcoholic groups mentioned in the literature. The rate for the Addiction Research Foundation sample is found to be 2.28, which is almost the same as for our group (2.51), and also for Sundby's vagrant group of alcoholics (Table XIII-18). Thus, although we might conclude from our comparison with Lipscomb's figures that the C.D.O.s had a higher death rate from respiratory disease due to alcoholism complicated by the Skid Row way of life, this does not hold when we compare them with another group of Toronto alcoholics. In this respect they appear to be more similar to the alcoholic group than to Bogue's Skid Row group. Once again we might suspect that the effects of the Skid Row way of life are tempered by the revolving door process.

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Diseases of the Digestive System

Although more chronic drunkenness offenders die from respiratory diseases, the rate of death when compared to that of the general adult male population in Ontario is higher for diseases of the digestive system (2.63 ratio compared to 2.22 ratio for respiratory diseases) (Table XIII-16).

Among digestive diseases it is Laennec's cirrhosis of the liver that is associated with alcoholism, but in our sample only two men died of it, yielding a death rate of .26 per 1,000, which is nevertheless twice that of the general male population (.13 per 1,000). When we compare ratios, we find Bogue's Skid Row rate to U.S. rate is 11.0 (13,p.228). We do not know the ratio for Lipscomb's group but since the mortality rate is very similar to Bogue's (1.64 and 1.57 respectively), the ratio, though lower, must be fairly high. The Addiction Research Foundation ratio is 11.49, and the ratio for the chronic drunkenness offender is 2.0.

As we mentioned in the review of the literature, there is controversy as to whether cirrhosis is at least partially attributable to dietary deficiencies. Whether it is, or whether it is entirely the result of constant and prolonged heavy consumption of alcohol⁹ the revolving door process is probably a factor in keeping the number of deaths due to cirrhosis at a relatively low level among C.D.O.s. Dietary deficiencies or caloric imbalance, while not eliminated, are alleviated by periodic incarceration. Alcohol consumption is not maintained at a steady high level. Whether or not the C.D.O. is a spree drinker by nature, he is certainly one by necessity. The revolving door provides him with frequent periods of abstinence between drinking bouts.

Sundby, like Pequignot (100) concludes that malnutrition and cirrhosis are unrelated. He bases his conclusion partly on the assumption that malnutrition is more characteristic of the vagrant than the non-vagrant alcoholics in his sample, yet there was no variation in mortality from cirrhosis between the two groups. Also, he connects cirrhosis directly to alcoholism because cirrhosis rates decline in the older age groups, those groups which are in the passive stage of alcoholism and whose consumption of alcohol is lower.

⁹ An explanation for the similarity of rates of Lipscomb's alcoholic sample and the Skid Row group (of whom only one-third are alcoholics or heavy drinkers) would be difficult on this basis.

Sundby's overall mortality rates from digestive diseases are similar to ours (Table XIII-17), but his findings differ in that he found excess mortality from cirrhosis only. The majority of deaths in our sample from digestive tract diseases (N=13) were attributed to peptic ulcers (9 cases or 69%). These are related to alcoholism in that heavy alcohol use leads to an increased secretion of acid and so to increased irritation of the mucosa. Heavy smoking contributes to the chronicity and recurrence of peptic ulcers (9, p.907) and heavy smoking is characteristic of the chronic drunkenness offender. The death rate from ulcers is 6 times larger than that of the general male population.

Nervous and Sensory Diseases

Although comparison of the simple death rate for the sample and the normal population indicates that the risk of death from this cause is less for the C.D.O. than for the normal male, the age standardized death rate shows that this differential degree of risk is illusory and merely a matter of variation in age distribution.

Bogue's sample has a higher rate of death from nervous and sensory diseases than either the Toronto sample or Lipscomb's sample, and while this may indicate that the Skid Row way of life is conducive to these diseases, we must keep in mind the fact that some men may have ended up on Skid Row in part because they already had one of these diseases and so could not function in the normal society (13, ch. 2).

Beeson and McDermott state that acute alcoholism may result in cerebral vascular accidents and in arsenical polyneuropathy (a form of neuritis), but there is no evidence of a necessary connection between alcoholism and nervous diseases (9, p.1615).

Infective and Parasitic Diseases

There were only 5 deaths recorded from diseases in this category (Table XIII-12) so that the figures are too small to be statistically meaningful. However, the chronic drunkenness offender is probably exposed to greater risk from these causes than the normal male population. Living on Skid Row with its frequently unsanitary and crowded conditions exposes him, as we have already pointed out, more readily to respiratory diseases and certainly to infectious ones, and his life style makes him more vulnerable to infection. Pulmonary tuberculosis in particular has been shown to have a high incidence on Skid Row. Bogue (13, p.228) found that tuberculosis as a cause of death among his Skid Row sample was 36.9 times as large as the national rate for males. Sundby found a difference, but not a very great one, between the vagrant (2.73) and the non-vagrant (2.14) alcoholics. In both cases the rate was higher than the overall Norwegian mortality rate.

Lipscomb's group of alcoholics had a slightly higher rate for infectious diseases altogether than the general population (.45 per 1,000 compared to .16). He found only four cases in which TB was mentioned either as cause or contributing factor to death. The A.R.F. group of alcoholics had no recorded death due to tuberculosis.

As we have already noted, there is disagreement in the literature as to the relationship between alcoholism and tuberculosis. Since TB has been considered a social problem and a disease of the poor, we might account for this discrepancy of opinion and findings if we knew the social classes from which the various samples mentioned in our review of the literature came. Certainly Lipscomb's small number and the

absence of any tuberculosis deaths in Schmidt and deLint's group tend to support Arnould's conclusion that alcoholism and tuberculosis are not related developmentally (6).

There were three (1.8% of the total) deaths from tuberculosis in our sample. We might conclude from this that Toronto Skid Row is a much healthier place to live than Chicago Skid Row as far as tuberculosis and other infectious diseases are concerned. However, Olin (90) found that the prevalence of TB is extremely high among Toronto chronic drunkenness offenders (Chapter XII, Physical Health, p.13). Nine point eight per cent were proven to have, or to have had, TB, and eighty per cent reacted positively to a tuberculin skin test.

The fact that TB is a low cause of death, although so prevalent a disease, presumably indicates either a good therapeutic program of early detection and treatment and/or that the revolving door mitigates against severe and advanced cases, and reduces the C.D.O.'s susceptibility to fatal effects from this disease.

Alcoholism

Although various authors such as Moore (81) and Nicholl and Bellows (86) suggest that deaths from alcohol are underestimated, particularly when the statistics are compiled from death certificates, it can also be argued that attributing death to alcoholism by itself does little to further our knowledge. As a contributory cause, "chronic" and "acute" alcoholism are understandable and useful terms. As a primary cause the terms are neither particularly understandable nor useful. How does one die of chronic alcoholism? Does acute alcoholism differ from 'acute alcoholic poisoning' - which is entered in the poisoning category? Moreover, it is important to know the immediate cause of death: suicide, the fatal accident while drunk, cirrhosis of the liver. Without the latter information we are unable to learn in what way acute or chronic alcoholism contributes to the manner of dying.

In our sample, alcoholism accounted for 2.36 per cent of the 169 deaths. Three were listed as acute and one as chronic alcoholism. In all four cases no other morbid or contributing conditions were listed. An autopsy performed on one of the four apparently yielded no further information.

Thirty male deaths in the Addiction Research Foundation sample were attributed to alcoholism (whether acute or chronic is not specified). Although the percentage is almost twice (4.69%) that of the C.D.O. group, the ratios are the same (Table XIII-15). If anything, we would have expected a higher rate for the C.D.O. than for the A.R.F. group, since we felt that the attending doctor would be more likely to state alcoholism as the cause of death in the case of an obviously derelict drunk than in the case of a man with a family who might be upset at such a diagnosis.

Sundby found a similarly high ratio (25.96) between observed and expected deaths from chronic alcoholism, but no difference between the vagrant and non-vagrant groups. He too suggests that as a cause of death chronic alcoholism is an ambiguous diagnosis. Moreover, unlike the authors mentioned above, Sundby feels that deaths from chronic alcoholism may have been overestimated rather than underestimated; that many were in fact due to a cardiomyopathy with heart failure.

Bogue (13, p.228) reports a death rate of .37 per 1,000 which is about half the 0.7 rate for the C.D.O. group.

The chronic drunkenness offender sample shows a not unexpected similarity to other alcoholic groups in respect to alcoholism mortality. Sundby's findings are in keeping with ours.

Other Causes of Death

We have accounted for 162 of the deaths in our sample. The remaining 7 deaths include 4 from diseases of the genito-urinary system, 1 from diabetic coma, 1 from malnutrition, and 1 from pernicious anemia. There is nothing in the literature to relate genito-urinary diseases to either alcoholism or to Skid Row.

CONCLUSION

The morbidity and mortality patterns of the chronic drunkenness offenders have been shown to differ considerably from those of the general population. Both their Skid Row life style and their alcoholism contribute to these distinctive patterns. We might have expected the alcoholism and Skid Row living conditions to supplement or even potentiate one another since as alcoholics the C.D.O.s are exposed to certain death risks differing from the normal, and as Skid Row-ers they have additional risks. As it turns out, however, it is not a simple matter of adding the two together. Instead they appear to modify each other in a variety of ways.

Chronic drunkenness offenders have a higher mortality rate than the average Ontario male as we have seen when we compared the ages of death, the life expectancy and the survival rates of each. They tend to die at a younger age, have fewer years of life left at every age level, and the survival rate is lower than that of the general population.

A number of studies substantiate that alcoholics are likely to have a shorter life span than the general population. But men on Skid Row are also, according to Bogue's findings, likely to die earlier than the average. We found, however, that our sample of chronic drunkenness offenders had a later average age of death, or a greater proportion of deaths occurred in a higher age grouping than either the Addiction Research Foundation alcoholic sample or the Skid Row group in Chicago, though our sample differed more from the Chicago than the A.R.F. sample in these measures.

The survival rate for the C.D.O., which is lower than for the general population, corresponds very closely to the survival rate of Lipscomb's alcoholic group.

We were not able to compare the chronic drunkenness offender sample consistently with all four other comparison groups - that is, Lipscomb's and the Addiction Research Foundation groups, Sundby's vagrant-alcoholic group and Bogue's Skid Row group - on every count, either because the information was lacking or the categories differed or the statistics were organized differently. However, the general picture indicates that even though the alcoholics in Lipscomb's and the A.R.F. sample are on the average of higher socio-economic status than the C.D.O.s, the chronic drunkenness offenders' mortality experience resembles these groups more than that of the Skid Row sample. This shows up more clearly in our comparison of causes of death.

The chronic drunkenness offender is susceptible beyond the normal expectation to death from accidents, diseases of the respiratory system, and diseases of the digestive system. This high excess mortality from accidents and other violent causes has been repeatedly noted in the literature on alcoholics and is characteristic of Lipscomb's and the A.R.F. sample, both of which have a rate close to that of the C.D.O. However, living on Skid Row presents an even greater hazard from violent deaths since the death rate from such causes is even higher among the Chicago Skid Row sample than among the other three samples. The data do not

enable us to explain why our C.D.O.s are less susceptible to violent deaths than the inhabitants of Chicago's Skid Row, but two facts should be taken into account:

- (1) the general population of Toronto has a lower rate of deaths from violent causes than is found in Chicago, and
- (2) the considerable period of each year that our C.D.O.s spend in jail decreases their exposure to the hazards of Skid Row existence.

There are two noteworthy departures of the chronic drunkenness offender from the general alcoholic pattern within this category. One is the lower suicide rate and the other is the lower rate of deaths by poisoning. The contrast with the other Toronto group - the Addiction Research Foundation sample - is particularly marked. We can only speculate on the reasons for the difference. From our study it seems that drinking is no longer a painful moral issue for the chronic drunkenness offender (Chapter XI, Drinking History). It is possible that the patients in the A.R.F. sample are more influenced by middle class standards and are more likely to feel guilt or remorse at their inability to abstain or hopelessness in dealing with their problems and the vision of losing everything of value to them.

Perhaps it is easier to accept life when one has lost everything than when one is in the process of losing everything. Also, the chronic drunkenness offender associates chiefly with fellow drinkers; not with relatives, friends, and others who would make him feel guilty.

The Addiction Research Foundation sample had a ratio of deaths through poisoning of 11.37, as compared to .25 in the chronic drunkenness offender sample. Since non-beverage alcohol consumption is more likely to occur among C.D.O.s we might have expected just the opposite. As most of the poisonings in the A.R.F. sample were from barbiturates or other drugs, the difference may reflect more general class differences in drug use. Schmidt, Smart and Moss (114) found that the lowest socio-economic group (Class III) among the alcoholic Clinic patients they studied received much less sedative and antidepressant medication from the Clinic doctors than the two higher status groups, even though all three classes had similar proportions of patients who were described as "depressed" (p.73).

At the same time we know from our current study that many of the men in the 1961 chronic drunkenness offender sample have been prescribed such medication, particularly the barbiturates - often a month's supply at a time.¹⁰ Although some of the men simply sell their supply, others have become addicted to the point of being known as "pill heads". Thus class differences in drug use would appear not to account adequately for the difference in ratios of death from poisoning between the C.D.O. and the A.R.F. samples.

¹⁰ Such prescriptions came chiefly from doctors at a DVA and a general hospital, not the A.R.F. Clinic. Chronic drunkenness offenders form a distinct sub-group within a low status class and as such differ from the low-status alcoholics who become patients at the Clinic. Also, although all Skid Row-ers are in the low socio-economic class, all members of that class do not belong to Skid Row.

From the data in this chapter we can see that two major factors affect the chronic drunkenness offender's mortality picture so that it differs from that of the general population. These are his alcoholism and his Skid Row living conditions. Alcoholism appears to affect his mortality to a much greater degree than the Skid Row factors. In some areas, such as respiratory and infective diseases, the two factors potentiate one another, making it difficult to allocate primary cause: that is, his heavy drinking (concomitant with not eating) leaves the person in a weakened physical condition and receptive to viruses and infections of all kinds which are likely to be picked up in the crowded sleeping quarters and unsanitary arrangements found on Skid Row.

However, although the C.D.O. resembles the alcoholic more than the Skid Row habitué in terms of rates and causes of death, he nevertheless shows a considerable difference from other alcoholics. The inescapable conclusion is that the 'revolving door' has a profound modifying influence on the physiological effects of alcohol. At the same time, it reduces the risks associated with Skid Row living. These effects are seen on the longer average life span of the C.D.O. compared to a Skid Row population, the lower rates of death from alcohol-associated types of cancer and from cirrhosis of the liver compared to other alcoholic groups, and from accidents and respiratory diseases in comparison to men on Chicago's Skid Row.

The numerous relatively short periods spent in jail enforce the spree type of drinking pattern and militate against a constant, sustained drinking pattern, thereby reducing the possibility of irreversible liver damage - and perhaps certain types of cancer. The physical recuperation and build-up while in jail help to protect against infectious diseases. And, finally, the actual time spent in the Skid Row environment is cut down considerably, thus reducing the amount of exposure to infections and risk from accidents associated with both Skid Row and with intoxication.

APPENDIX I

Year	No. alive	No. of deaths	No.with- drawals ^a	Adjust. factor ^b	Corrected no.alive ^b	Prob.of dying ^c	Prob.of living ^d	Cumul. surv. rate ^e	Cumul. surv.rte Ontario ^e
1940	343	8	31	27.9	315	.02539	.97461	.97461	.99139
1941	304	10	2	0.6	303	.03300	.96700	.94245	.98272
1942	292	4	3	1.8	290	.01379	.98621	.92945	.97319
1943	285	11	1	0.9	284	.03873	.96127	.89345	.96279
1944	273	4	1	0.7	272	.01470	.98530	.88032	.95145
1945	268	13	0	0.0	268	.04850	.95150	.83762	.93911
1946	255	6	1	0.6	254	.02362	.97638	.81783	.92569
1947	248	11	5	2.0	246	.04471	.95529	.78126	.91110
1948	232	10	4	0.8	231	.04329	.95671	.74744	.89542
1949	218	11	2	0.4	218	.05045	.94955	.70973	.87859
1950	205	12	4	2.8	202	.05940	.94060	.66757	.86042
1951	189	9	3	1.2	188	.04787	.95213	.63561	.84121
1952	177	9	6	3.0	174	.05172	.94828	.60274	.82065
1953	162	5	2	1.0	161	.03105	.96895	.58402	.79886
1954	155	8	2	0.4	155	.05161	.94839	.55388	.77637
1955	145	8	0	0.0	145	.05517	.94483	.52332	.75302
1956	137	9	0	0.0	137	.06579	.94321	.49360	.72884
1957	128	6	3	2.1	126	.04761	.95239	.47010	.70356
1958	119	8	4	2.1	117	.06837	.93163	.43796	.67729
1959	107	6	6	2.5	105	.05714	.94393	.41530	.65117
1960	95	14	9	2.8	92	.15227	.84773	.35206	.62424
1961	72	9	6	3.6	69	.13043	.86957	.30614	.59643

LIFE TABLE FOR THE TORONTO CHRONIC DRUNKENNESS OFFENDER MORTALITY SAMPLE

(See footnotes on following page.)

Footnotes to APPENDIX I:

^a Number of withdrawals means the number lost trace of during that year.

^b The adjustment factor is designed to correct for those individuals lost trace of. For example, it may be impossible to trace an individual past April of a particular year so that in effect he has not been exposed to death for 8/12 of the year. The period of non-exposure to the risk of death for each withdrawal in any particular year is taken as a percentage of 1 and summed. The sum of the adjustment factors is then subtracted from the number alive to yield the corrected number alive or the effective number of persons exposed to death.

For the purposes of this study the numbers in this column are taken to the nearest whole number. The adjustment factor is calculated only for withdrawals (i.e. those lost trace of) and not for death, since the time of death is assumed to be similarly distributed in both the sample and the Ontario population.

^c This is the probability of a person's not living until his next birthday. It is obtained by dividing the number of deaths by the corrected number alive.

^d This is the probability of a person's living until his next birthday and is obtained by subtracting the probability of dying from 1.

^e The cumulative survival rate is the product of the probability of living a given year of all previous years, multiplied by the present year. (i.e., the cumulative survival rate for 1941 is $.97461 \times .96700$; for 1942, $.97461 \times .96700 \times .98621$.)

CHAPTER XIII

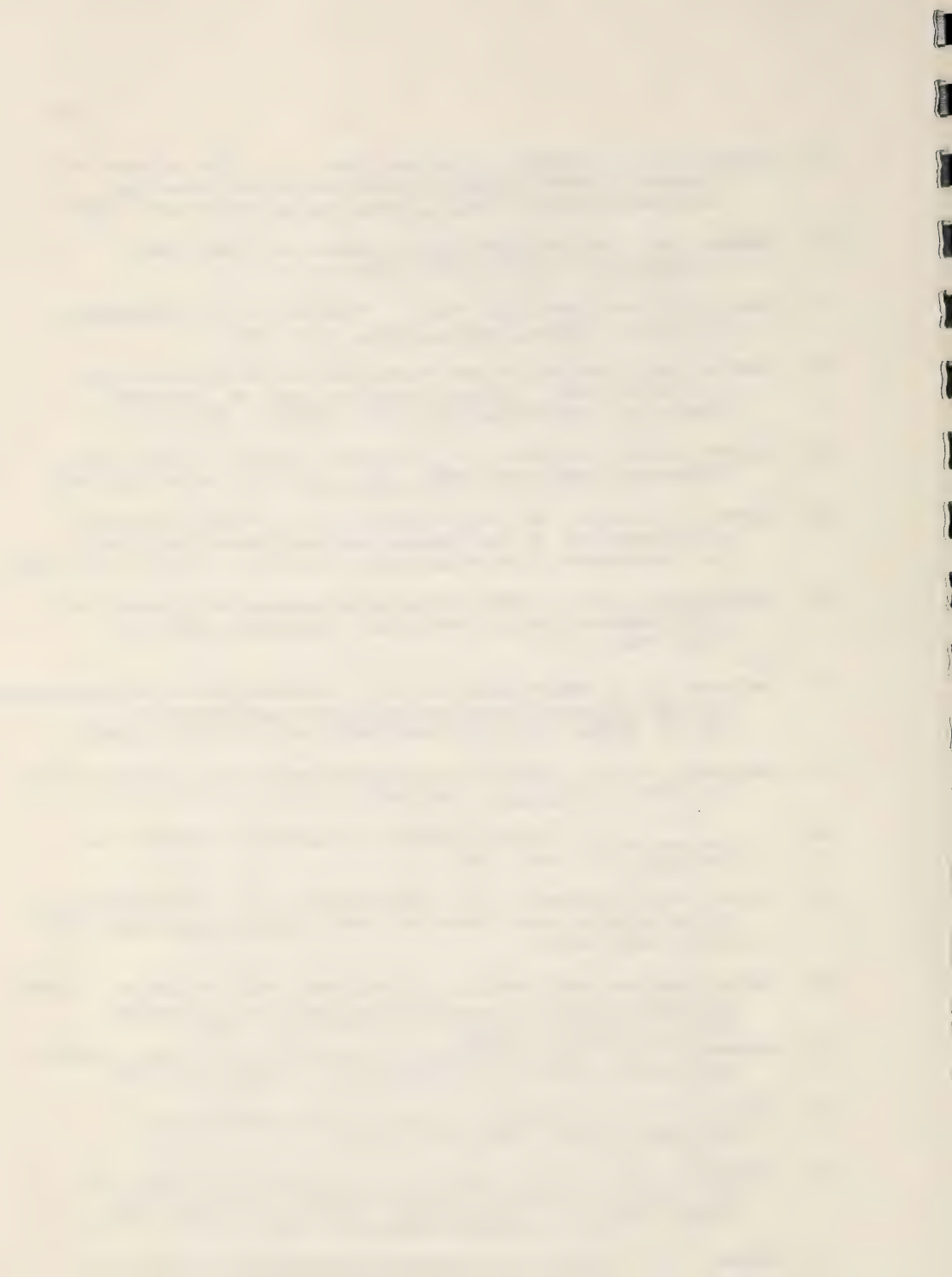
AGES AND CAUSES OF DEATH OF THE CHRONIC
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